James DeYoung Plant - Coal Yard and Ash Pond Detection Monitoring & Status of Closure Documentation

Holland Board of Public Works

Holland, Michigan

NTH Project No. 73-160017

May 28, 2019

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TABLE OF CONTENTS

James DeYoung (JDY) Power Plant Coal Yard and Ash Pond
Detection Monitoring and Status of Closure Documentation

NTH Consultants, Ltd. (NTH) has prepared this summary discussing the activities related to the coal yard and Coal Combustion Residuals (CCR) Impoundments (bottom ash)/Ash Pond removal and summary of closure documentation at the James DeYoung (JDY) power plant property (the Property).

GROUNDWATER DETECTION MONITORING – REGULATORY BASIS

A limited hydrogeological investigation work plan was developed for the Property in 2009 that established a groundwater detection monitoring program to address the requirements of Michigan Administrative Code R 323.2237(4) of Michigan's Natural Resources and Environmental Protection Act, 1994 Public Act 451, as amended (Act 451). The work plan pre-dated the detection monitoring requirements contained in the final federal CCR rules (specifically 40 CFR 257.94), however the detection monitoring program was conducted for purposes of satisfying a request by Michigan Department of Environmental Quality to determine whether the presence of bottom ash lagoons (CCR units) may have affected groundwater quality in the surrounding area. The results of this initial investigation indicated additional investigative activities were merited.

In 2011, BPW initiated subsequent groundwater investigation activities at the Property, including the installation of additional monitoring wells, collection of groundwater elevation data, and collection of groundwater samples for the analysis of a subset of metals on a quarterly basis, for a period of more than three years. The results of the subsequent investigation identified that certain metals were present in the groundwater above the U.S. EPA's Safe Drinking Water Act's maximum contaminant level (MCL) established in 40 CFR §141.62, and it was concluded that the groundwater quality in the surrounding area may have been affected by the historical use of the CCR impoundments.

Based on the initial groundwater detection monitoring results along with anticipated retirement of the plant combined with the CCR Rule requirements, Holland BPW elected to initiate an assessment of corrective measures (in accordance with 40 CFR §257.96) and close the CCR units through removal of CCR and decontamination of the CCR impoundments in accordance with 40 CFR §257.102. Final closure of the CCR units is currently being completed in substantial conformance with 40 CFR §257.101 and 40 CFR §257.103, and the written closure plan prepared by NTH Consultants, Ltd., (NTH) dated October 17, 2016.

SUMMARY OF CLOSURE DOCUMENTATION

Beginning in May of 2017, Holland BPW began removal of coal and CCR materials from the Property. Removal of the coal and CCR materials along with restoration of the Property was completed in June of 2018. The efforts to complete removal and achieve closure of the CCR impoundments was conducted in accordance with the self-implementing requirements of Part 257 of Title 40, Protection of Environment, of the Code of Federal Regulations (CCR Rule), and State regulations to document removal of the coal and CCR, solid waste residuals consistent with Part 115 Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451) with removal consistent with nonresidential cleanup criteria of Part 201, Environmental Remediation of Act 451.

Closure reports for the Coal Yard and CCR Impoundments along with a report that also evaluated CCR Beneficial Use at the Property were prepared and submitted to the Michigan Department of Environmental Quality (DEQ), now Department of Environment, Great Lakes and Energy (EGLE) on behalf of the Holland BPW during September 2018. These reports, along with supplemental information included in a report dated January 8, 2019 with amendments provided on March 9th and March 25th 2019, outline the steps taken and the documentation prepared to verify removal of the residual coal and CCR from the Property. These reports are included by reference in this report, copies are included in **Appendix A**.

In a letter dated April 11, 2019, the DEQ stated they had reviewed the Bottom Ash Ponds 1-3 CCR and Former Coal Pile Removal Documentation Report that was submitted on January 9, 2019 and amended on March 9th and March 25th, 2019. The letter states that "based on observations made by DEQ staff during the removal process and the report, the DEQ concurs with Holland BPW that the Bottom ash in Ponds 1-3 and the coal pile has been removed and multiple lines of evidence of the removal has been documented." The letter further states "this certification approval is simply for removal of the coal waste and bottom ash that is a regulated solid waste under Part 115-Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended." A copy of the letter is included in **Appendix B**.

Information contained in the reports discussed below summarize activities that have been completed to remove solid waste residuals associated with the former coal pile and CCR management activities. The reports are maintained by Holland BPW as part of their due care documentation as they summarize actions completed documenting compliance with Part 201 obligations that no unacceptable exposures are present based on the present use of the property.

Report documenting Coal Yard Closure dated September 2018 (See Appendix A.1):
This report documents the closure of the coal yard at the James DeYoung power plant Property. The closure of the coal pile included removing the usable coal from the site and excavating and disposing of the remaining coal/soil mixture from beneath the former coal pile. Removal verification points were visually inspected and documented prior to granular fill and topsoil placement in the approved area. This report addresses portions of the coal pile area not underlain by coal combustion residuals (CCRs).

Report documenting closure of the Coal Combustion Residual (CCR) impoundments at the James DeYoung power plant dated September 2018 (See Appendix A.2):
This report documents actions pertaining to removal and closure of the James DeYoung CCR Surface Impoundment System by removal of CCR in accordance with 257.102(c) and provides certification of the closure activities completed in accordance with 257.102(f)(3). Site activities included the removal of CCR material found in the surface impoundment /ash handling areas for the closure of the three incised surface impoundment ponds. After excavation verification documentation was completed, the areas were backfilled with sand, topsoil and a vegetative cover over the entire area. Verification points for clean closure were visually observed for CCR removal to *de minimus* levels inclusive of soil samples collected at 25 percent of the verification points for analytical testing. Quality assurance activities included surveying, material testing, reviewing laboratory analytical results, and related closure activity observations completed in the CCR area. Laboratory test results for soil samples were compared to applicable part 201 cleanup criteria to verify that CCR was sufficiently removed prior to granular fill and topsoil being placed. These actions were completed from August 2017 to May 2018, and site restoration was completed in June 2018.

Report documenting CCR used for beneficial reuse dated September 2018 (See Appendix A.3)
This report documents the investigation and handling of Coal Combustion Residual (CCR) materials that were determined to have been used beneficially as a leveling/base layer for a former gravel parking area and also as backfill for underground utility infrastructure on a portion of the Property. The beneficially used CCR materials comprising a portion of the backfill over pipelines that are part of the infrastructure for the City's snowmelt system remain in place in the northeast portion of the Property. The leveling layer of CCR materials used below a former gravel parking area was removed. It should be noted that analytical results from samples of backfill materials surrounding a portion of the pipeline were below nonresidential criteria.

Report documenting **CCR Impoundment Closure Addendum dated January 2019 amended March 2019 (See Appendix A.4)**

As part of the initial review of documentation presented in the Closure Certification CCR Impoundments report, the DEQ requested additional verification information for a limited area in the southwestern corner of the Property. Microscopic examination of all soil samples collected from the uppermost layer of subsoil beneath the sand and topsoil fill as part of this supplemental investigation confirmed that the soils samples collected at the two original boring locations, and all other boring locations in the vicinity did **not** identify materials with more than 5% CCR or coal. In fact the gray silty soils observed at the boring location in question (5076A-1) are very similar in color and texture to CCR material and it took microscopic examination to verify ash was not present. It was further concluded that it is likely that the "ash" layer originally logged during initial Geoprobe boring activities at boring locations 5076 and 5076A in October of 2016 was likely to have been misidentified.

The actions taken by Holland BPW include removal of all but *de minimus* amounts of coal and CCR/coal ash residuals. The documentation included in the aforementioned reports demonstrates that residual concentrations of various metals associated with CCR/coal ash were found below Part 201 generic nonresidential risk based cleanup criteria on all portions of the Property; in fact the analytical data collected as part of the CCR removal verification process were below generic residential cleanup at a majority of the verification points analyzed.

As is documented in the referenced reports found in Appendix A, the JDY Property was restored with layers of clean fill and topsoil after residual coal and CCR materials were removed; this effectively provides a direct contact barrier such that residual constituents exceeding their respective generic residential cleanup criteria in subsurface soils are beneath this clean soil layer. This enhances the protective measures completed at the Property and further demonstrates Holland BPW's commitment to restoring the site for future productive reuse.

Ongoing groundwater assessment monitoring is being conducted at the Property consistent with 40 CFR §257.95 and §257.102 (c), in part to demonstrate potentially impacted groundwater is not migrating off the property at concentrations in excess of applicable criteria. Monitoring will continue until such time as Holland BPW is able to demonstrate compliance with obligations under the CCR Rule in affected media on the Property.

ATTACHMENTS

A.1- A.4

A.1 - Coal Yard Closure Report

A.2 - CCR Impoundment Closure Report

A.3 - CCR Beneficial Use Documentation Report

A.4 –Addendum Rpt_Rev 2

CLOSURE CERTIFICATION

James DeYoung Power Plant

Coal Yard

Holland Board of Public Works

Holland, Michigan

NTH Project No. 73-160017-05

September 2018

NTH Consultants, Ltd.
608 S, Washington Avenue
Lansing, MI 48933

TABLE OF CONTENTS

1.0 INTRODUCTION

This report documents the closure of the coal yard at the James DeYoung power plant owned by the Holland Board of Public Works (HPBW). The closure of the James DeYoung coal pile included removing the usable coal from the site and excavating and disposing of the remaining coal/soil mixture. Clean closure verification points were visually inspected and documented prior to granular fill and topsoil placement in the approved area. This report addresses portions of the coal pile area not underlain by coal combustion residuals (CCRs). The majority of CCR removal and CCR pond closure was completed after the closure of the coal yard, which is addressed separately in the *CCR Surface Impoundment System Closure Certification Report*.

The plant is located at 64 Pine Avenue in Holland, Michigan near the eastern end of Lake Macatawa. Coal and coal/soil removal from the site was completed between August 2017 and November 2017. Backfilling of clean soil and site restoration was completed in May 2018.

This report was prepared by NTH Consultants, Ltd. and Engineering & Environmental Solutions, LLC to document removal of the impacted soil, surveying, observations, and material testing performed during closure of the coal area. This project was completed in substantial conformance with standard construction practices, project specifications, and Part 115 of the Natural Resources Protection Act, 1994, PA 451, as amended.

1.1 PERSONNEL

The key personnel involved in the construction of this project are listed below:

Owner - Holland Board of Public Works (HBPW)

Jane Monroe, Project Manager
Andrew Reynolds, Project Engineer/ Certified Construction Storm Water Management Operator
Theo VanAken, Certified Construction Storm Water Management Operator
Fred Heiser, Electric Production Maintenance Supervisor
Judy Visscher, Environmental Regulatory Specialist

Program Management - NTH Consultants, Ltd. (NTH)

Jeff Jaros, Project Manager
David Lutz, P.E., Project Engineer
Brad Venman, Project Toxicologist

Engineering Design and Construction Verification – Engineering & Environmental Solutions, LLC (E&E Solutions)

Blaine Litteral, P.E., CQA Field Officer
Daniel J. Schaafsma, P.E., Project Engineer
Kurt Van Appledorn, P.G., Project Geologist
Mitchell Stark, CQA Field Engineer
Amy Mandrell, CQA Field Engineer

General Contractor - Ryan Incorporated Central (Ryan Inc.)

Chris Downs, General Superintendent
John Lafferty, Operations Manager
Robert Koski, Site Superintendent
John Burt, Contract Administration

Soil Testing Laboratory - Driesenga & Associates, Inc. (Driesenga)

Jake Stocking, Project Manager

Analytical Laboratory - ALS Environmental (ALS)

Bill Carey, Project Manager

1.2 PROJECT SEQUENCE

The removal of coal and most of the CCR materials were performed separately, with the removal of CCR material detailed separately in the *CCR Surface Impoundment System Closure Certification Report*. The contractor completed a majority of tasks concurrently, however, the following construction sequence was generally followed:

1. Demolition of the conveyor system and removal from the site;
2. Demolition of the concrete coal hopper and abandonment in-place of the hopper foundations;
3. Removal of pump buildings, fences, monitoring wells, and other structures necessary to aid in excavation;
4. Removal of coal remaining on site for re-use at other facilities;
5. Excavation and off-site landfill disposal of coal/soil mixture;
6. Confirmation of coal removal through visual observation and elevation survey;
7. Placement of sand backfill;
8. Placement of topsoil layer;
9. Final grading of approved area;
10. Grading of surrounding areas as necessary;
11. Installation of new fence and monitoring wells; and
12. Placement of seed and mulch over disturbed areas.

1.3 REFERENCES

The following references were utilized by the field engineering personnel as part of the Construction Quality Assurance (CQA) management of this project:

1. Part 115 of the Natural Resources Protection Act, 1994, PA 451, as amended;
2. Coal Yard Closure Plan – Coal Removal Visual Documentation Procedure, Revision 1 – August 10, 2017 (Visual Documentation Procedure) prepared by E&E Solutions and NTH;

3. James DeYoung Power Plant Coal Pile and CCR Surface Impoundment Systems Closures, Issued for Construction Documents, dated August 2017, prepared by E&E Solutions.

1.4 PURPOSE AND SCOPE

This certification report is based on the observations and measurements made by personnel during the course of construction, including review of data provided to E&E Solutions and NTH. The purpose of this document is to present documentation of observations, measurements, and data of coal materials removed from the site in accordance with the project documents noted in Section 1.3, including final grading and site restoration.

Throughout the duration of the project, the field CQA personnel observed and documented construction progress, performed visual observations of coal removal, completed elevation survey in removal areas, and gathered and arranged testing of soil materials used for backfill. The construction verification documented in this report includes:

1. Field reports detailing observation of construction activities, weather conditions, and testing performed during each visit by CQA personnel;
2. Quality conformance sampling and testing of the backfill and topsoil used in construction;
3. On-site visual observations to verify removal of coal and coal/soil mixture;
4. Testing of structural fill for in-place density and moisture; and
5. Documentation of site grades and construction quantities.

2.0 CONSTRUCTION VERIFICATION

CQA personnel implemented verification procedures to document removal of coal materials from the site and restoration in accordance with the reference documents noted in Section 1.3. Responsibilities and necessary documentation is provided in the following sections.

2.1 CQA FIELD OFFICER

The CQA Field Officer is a Professional Engineer licensed in the State of Michigan and experienced in the fields of geotechnical engineering, earthwork and site remediation. The CQA Field Officer was selected by the Owner and was responsible for the implementation of the requirements of the Construction Documents and certifying that construction is as described in this document.

The CQA Field Officer was responsible for:

- Managing field CQA personnel, periodic observation of the site and construction activities, and reviewing logs, test data, and other documentation;
- Approval of materials being used for construction;
- Selection of third-party material testing laboratories; and
- Certification of construction in accordance with the Construction Documents.

2.2 CQA FIELD ENGINEER

The CQA Field Engineer was the person, or persons, responsible for the observation of construction activities, performing necessary tests and measurements, and developing documentation of the coal removal and site restoration. The CQA Field Engineer periodically visited the construction site when active construction was being performed and maintained a log of site activities during each visit. The CQA Field Engineer was responsible for the sampling, testing, and documentation of coal impacted soil removal, demolition and restoration activities.

The CQA Field Engineer is knowledgeable in the construction and testing techniques employed for the stage of construction being completed. The CQA Field Engineer was responsible for performing the required field observation and testing, including visual verification of soil removal, GPS surveys, density testing, grain size distribution and soil classification tests.

The CQA Field Engineer was responsible for reporting non-conformance of construction activities to the CQA Field Officer, the Construction Contractor and the Owner or his authorized representative. The CQA Field Engineer is responsible for observation and documentation of repairs and deviations from the original design.

2.3 DOCUMENTATION

2.3.1 Field and Photograph Reports

The cornerstone of the documentation is the collection of field reports and photographs, prepared by field personnel. These reports summarize verification and construction activities during each site visit. Field reports are provided in Appendix A and document the following:

- Date and time of visit;
- Weather conditions;
- Personnel on-site;
- Construction activities including equipment used and materials placed; and
- CQA activities, including material sampling and testing, point inspection, and other observation and testing activities.

The CQA Field Engineer prepared photograph reports to document coal removal at the specified grid nodes, as excavation activities progressed. The reports are included in Appendix B.1.

2.3.2 Construction Plans

Field personnel utilized site construction plans to show approximate grading limits, demolition requirements, the locations of samples taken, tests performed, and defects found during construction inspections. The CQA Field engineer completed surveying using a Leica Smart Station GPS, model RX1200 as necessary to verify grades, document testing locations and in-place material thickness. The construction plans are at an appropriate scale in order to show the recorded information clearly and have been updated to reflect “as-constructed” records. “For record” construction drawings are included in Appendix E.

3.0 COAL YARD EXCAVATION

Ryan Inc. completed coal yard excavation and grading. Work completed is detailed on construction record plans in Appendix E. The project consisted of the following activities:

1. Excavation dewatering;
2. Demolition and disposal of the coal yard hopper and conveyor;
3. Removal of abandoned pipe lines;
4. Excavating, loading, hauling, and landfill disposal of coal and coal/soil mixture;
5. Placement and compaction of clean granular fill;
6. Placement of clean topsoil layer;
7. Final grading; and
8. Seeding, fertilizing, and placement of mulch.

3.1 EXCAVATION DEWATERING

The contractor occasionally had to pump ponded surface water to aid in the excavation of coal and coal/soil mixture materials. The dewatering activities are documented in the CQA Field Engineer's field reports. Ponded water was pumped into the first CCR impoundment pond for settling, taking care to ensure that potentially contaminated material was not discharged.

The impoundment ponds were operated, and site water was discharged, in accordance with the requirements of the facility's National Pollutant Discharge Elimination System (NPDES) Permit No. MI0001473.

3.2 REMOVAL OF USABLE COAL

Prior to the start of construction activities, Ryan gathered usable coal for sale and distribution using an excavator, loader, skidsteer, and haul trucks. Ryan placed the usable coal in a pile located at the western portion of the site where it was screened. The pile location was chosen to allow storm water drainage to the east where it was pumped into the CCR impoundment before being discharged in accordance with the site's NPDES Permit. Ryan loaded the screened material on ships and transported it off site. Approximately 5,600 tons of usable coal was recovered from the site for use at other locations.

3.3 DEMOLITION AND DISPOSAL OF CONVEYOR AND COAL HOPPER BUILDING

The James DeYoung Power Plant's coal conveyor spanned from the center of the coal yard to the top of the plant and was used to deliver coal to the hoppers during plant operation. The conveyor was removed by a subcontractor, Pitsch Co., during closure of the coal yard. To remove the conveyor, Pitsch first disassembled it in small sections using a crane. Next, the concrete base structures were demolished to approximately 3 feet below grade using a wrecking ball attachment on an excavator. The excavation was filled with flowable fill if standing water was present and/or granular fill to existing grade.

3.4 PIPE WORK

Construction plans called for various existing subsurface pipes on site to either be removed or left in-place depending on site requirements. During excavation, Ryan removed the 24-inch discharge pipe from Pond 3 to the pipeline leading to NPDES Outfall # 1. The pipe was in poor condition and would not be required following closure of the CCR ponds. A storm water inlet was installed where the pipe originally entered a manhole connecting it to the storm line leading to Outfall #1.

Ryan removed an abandoned 24-inch dredge line and 20-inch snowmelt line that passed though the north end of the excavation area. End caps were installed on the exposed pipe ends left in-place at the limits of excavation. A manhole near the center of the snowmelt pipe was excavated with a hydraulic excavator, the area was visually inspected for removal of coal materials, and backfilled with clean sand. Ryan removed the pipes with a hydraulic excavator and EES visually inspected the resulting trench to confirm removal of coal materials before Ryan backfilled the excavations with clean sand.

3.5 EXCAVATION AND DISPOSAL OF COAL /SOIL MIXTURE

After the usable coal and conveyor structures were removed from the site, Ryan excavated the remaining coal and coal/soil mixture (coal yard materials that were not suitable for use). Ryan completed excavation with an excavator, loader, GPS-assisted bulldozer, skid steer loader, and haul trucks. A loader was used to transfer the coal yard materials to a collection pile located on the concrete pad prior to being removed from the site to HBPW's Zeeland Township Landfill for disposal.

Once coal yard materials had been removed from the large concrete pad, it was cleaned of remaining coal residue. The cleaning process involved scraping off the coal yard materials layer using a dozer and a skid steer loader, followed by sweeping using a power broom. Surface cleaning was completed by power washing until it was free of coal-residue.

As it was located within the coal yard's boundaries, Ryan removed the fence along the south and west ends of the property during construction to allow removal of coal material.

The total amount of coal yard materials transported for disposal at the Zeeland Township landfill from the James DeYoung Power Plant work site was approximately 16,000 cubic yards.

4.0 SITE RESTORATION

4.1 PLACEMENT OF CLEAN GRANULAR FILL AND TOPSOIL LAYER

Upon verification of coal removal, the approved area was staked-off in order to prevent worksite vehicles from tracking contaminated soils back into the area. The area was then covered with a sand layer up to 12 inches using a GPS assisted D6 Bulldozer. In areas of limited access, the excavator was used to place and compact the sand.

In areas where groundwater was encountered or where excavation continued below groundwater level, Ryan placed the fill sand in a single lift up to 12 inches to bring the grade above groundwater level. Sand fill was then placed in regular lifts and compacted as described above.

Once an area was approved and covered with clean backfill, Ryan placed a 4-inch thick (minimum) layer of topsoil to support vegetative growth over the sand backfill using the GPS assisted D6 dozer. Final grading of the topsoil layer is at a tolerance of plus 0.20 foot from approved grade.

4.2 SEEDING AND FERTILIZER

The topsoil layer was seeded, fertilized and mulched to establish vegetation. Fertilizer, consisting of a Nitrogen – Phosphorus – Potassium ratio of 19-19-19, was mixed thoroughly into the upper 2 inches of topsoil. Mulching was done per the requirements outlined in MDOT 816.03(E) utilizing a high velocity mulch blanket per MDOT 816.03 and MDOT 917.15. Seed, provided by Evergreen Seed Supply was required to have a germination rate of not less than 80%, with the mixture and percent of seed as listed below.

Seed Variety	**Percent of Seed**
1. Perennial Rye Grass	50%
2. Kentucky Blue Grass	15%
3. Creeping Red Fescue Grass	35%

5.0 CONSTRUCTION VERIFICATION

EES completed construction quality assurance activities throughout the project to verify that coal materials were successfully removed and that the site was restored to a smooth even grade capable of supporting vegetation.

5.1 VERIFICATION OF COAL SOIL REMOVAL

EES documented removal of the coal/soil mixture by a process that relied on visual verification and surveying of the coal soil excavation. The process for verification of the removal of coal material was developed from the requirements in the *Coal Yard Closure Plan – Coal Removal Visual Documentation Procedure, Revision 1*, NTH Consultants, August 10, 2017 (Visual Documentation Procedure). This document required the removal be documented on a grid developed for the site based on the methods described in *Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria, 2002,* Michigan Department of Environmental Quality's (S3TM document).

A grid interval with an approximate spacing of 33.33 feet was developed based on guidance in the S3TM document and was superimposed over the entire excavation area. Site construction plans were utilized to show the locations of verification points, samples taken, tests performed, and deviations from approved design plans. All inspection locations are referenced to the site coordinate system, shown on a copy of the construction site plan in Appendix B.1. The excavation areas were divided into the coal yard and the CCR removal areas: Points 41-195 and

197-250 represent the coal yard. The coal yard excludes areas in which CCR materials were observed to be present in underlying soils.

EES surveyed the verification points before and after coal and coal/soil removal, using the Leica GPS to determine location and elevation. Survey data was tabulated and a topographic map of each surface was generated as evidence of removal (Sheets C-101 and C-102 of the Construction Record Drawings in Appendix E).

Once the location of the points was established by survey, EES completed visual verification as construction progressed to determine when no more than a *de minimus* level of 5 percent coal / 95 percent soil by area was achieved to demonstrate consistency and document coal removal. To ensure this criterion was met, a one square foot grid, divided into 100 squares was used and a photo taken from a standard height of 1.5 feet at each verification point. The grid assisted in providing a visual confirmation of residual coal. If more than 5 percent of coal material was observed as present within the grid, the area was further excavated prior to placement of backfill. EES documented observations and a description of the soil at each verification point, consistent with ASTM D 2488 for visual manual description of soils.

Soil descriptions included color, secondary texture, basic texture, supplementary textures, and other comments. The color of the natural soils on site were a light to dark brown, light to dark gray, or orange. The basic texture of the natural soils was sand, and the secondary texture was silty. The secondary texture was present in over 30 percent of the grid area, but still less than the basic constituent. Supplementary textures included minor constituents, described as trace (1 to 15 percent), little (15 to 30 percent), or some (30 to 50 percent). Supplementary textures observed on-site included gravel, clay, and peat. Other comments included the observation of roots, sticks, or shells. A verification photograph of the grid verification point, with the point number included, was taken at a minimum of 50 percent of the grid verification points as part of the documentation of coal removal. These observations and pictures are located in Appendix B.1.

The CQA Field Engineer visually verified structures removed from the site to 3 feet below finish grade. As part of the verification process, the concrete pad cleaning was visually confirmed once the entire pad was free of all coal and coal residuals.

5.2 GRANULAR FILL TESTING AND APPROVAL

EES evaluated the granular fill to confirm that it was from an uncontaminated source prior to delivery to the site. The CQA Field Engineer collected four representative grab samples from a pit located on the North side of Croswell Street, East of 152nd Avenue in West Olive, Michigan and delivered them to ALS for analysis of MI-10 metals. The analytical results indicated that concentrations of all metals were found to be within allowable background concentrations. The results are summarized and provided in Appendix C.1.1.

Material testing of the structural fill included performing a Modified Proctor Moisture Content-Density Relationship Test (ASTM D1557) and performing a sieve analysis (ASTM D422-63) periodically as material was delivered to the site. The CQA Field Engineer completed testing at a rate of one test per 5,000 cubic yards of material placed, or as material source changed. Driesenga

performed Modified Proctor Tests while sieve analyses were performed by the CQA Field Engineer. In total, three Modified Proctor tests and three grain distributions were performed on the approximate 9,300 cubic yards of subgrade fill placed and stockpiled in the coal yard. Sand backfill in the coal yard was placed as a single lift. Test results are located in Appendix C.1.2.

The CQA Field Engineer was responsible for observing the placement of granular fill and verifying that lift thickness and compaction was performed in accordance with project specifications. The CQA Field Engineer conducted field density and water content tests (ASTM D6938) to check the degree of compaction achieved using a nuclear density gauge. For field density and moisture content testing, a frequency of one set (three tests) per acre, per lift, per day was required. In total, seven sets (21 tests) were conducted to verify that backfill was compacted to at least 90 percent of its maximum dry density on the single lift placed in the 3.8-acre coal area. Testing locations were randomly selected to ensure an even distribution across the site. Maximum Dry Density values used during density testing were 108.5 pounds per cubic foot (PCF) and 107.5 PCF. The Maximum Dry Density result of 116.0 PCF from December 1, 2017 was disregarded as being out of range compared to other results for similar material.

On December 7, 2017, the CQA Field Engineer performed six sets (18 tests) on backfill placed in the coal yard. All density tests observed a compaction of 90 percent or greater, except for Test No. 14 and Test No. 15. These locations were re-tested as Test No. 1 and Test No. 2 on May 4, 2018. Both re-test compaction values achieved compaction greater than 90 percent of the maximum dry density value. One additional set (three tests) were performed within the coal yard on May 4, 2018 (Tests 3, 4, and 5) to ensure a greater distribution of compaction tests throughout the coal yard. Field density testing locations are referenced to the site coordinate system, shown on a copy of the construction site plan in Appendix B.2. Test results are located in Appendix C.1.3.

5.3 TOPSOIL TESTING AND APPROVAL

Approval of the topsoil source was based on conformance of the borrow source properties with design specifications. The project documents required the topsoil to be: locally available, natural topsoil, and free of contamination, ash, cinders, tree roots, and large stones. Test results are located in Appendix C.2.

Topsoil used in construction was sourced from the Lakeshore Sand Pit located on the South side of Perry Street, ¼ of a mile east of 40th Street in Ottawa County, Michigan. Prior to transportation to the site, five representative samples (TS-1 through TS-5) were collected by the CQA Field Engineer and delivered to ALS for testing. The first four of these samples were tested for the presence of MI-10 metals, and TS-5 was tested for pH and organic content. The source was verified to have metals concentrations consistent with background values, have an organic content above 2.5 percent, and a pH between 6.4 and 7.5, as required by the construction documents.

Topsoil samples TS-6 through TS-10 were collected from a second source, Brewer's Ready Mix Plant, at 3246 80th Avenue in Zeeland, MI. TS-6 through TS-9 were tested for the presence of MI-10 metals, and TS-10 was tested for pH and organic content. Laboratory results were compared to Part 201 Generic Cleanup Criteria and samples TS-6 through TS-9 were not found to

be below the Statewide Default Background Levels Criteria, and sample TS-10 did not meet the pH requirement. Therefore, the material from the 80th Avenue stockpiles was not used for backfill in the construction.

The CQA Field Engineer surveyed the site following completion of granular fill and topsoil placement to document finished grade and to verify the amount of granular and topsoil materials placed were consistent with project specifications. The Field Engineer verified the thickness of the topsoil with a spot check and shovel at each survey point to ensure that the contractor achieved a 4-inch minimum topsoil thickness. Once seeding was completed, the Field Engineer performed a site walk to verify all areas were seeded.

6.0 DEPARTURES FROM APPROVED DESIGN PLANS

Several departures from the original design drawings (Appendix E) and specifications were necessary due to the nature of field conditions encountered during construction activities. Prior to incorporation into construction, these departures were reviewed and approved by the CQA Field Officer, and when appropriate, by the MDEQ.

1. Final grades were adjusted to limit the amount of backfill materials required. The as-designed final grading plans were based on the assumption that the coal present in the coal/soil mixture was inert and would not be required to be removed; however, as a result of regulatory requirements, this coal/soil mixture was required to be removed during construction.
2. During excavation of the coal/soil mixture, several areas along the southern perimeter of the coal yard and around verification Point 196 were found to be underlain with CCR materials. These areas were removed from the coal pile restoration area and were addressed as part of the CCR pond closure. These areas are addressed in the separate *CCR Surface Impoundment System Closure Certification Report*.
3. The coal pile cover section in the initial plan set (Sheet C-501) called for a 6-inch layer of topsoil to be placed over the existing coal/soil mixture. This was based the assumption that the coal present in the coal/soil mixture was inert and would be left in place. As all coal and coal/soil mixture was removed to a *de minimus* 5 percent level with clean granular fill used for backfill, the topsoil thickness was reduced to 4 inches.
4. Only a portion of the 24-inch discharge pipe running from the CCR ponds to NPDES Outlet #1 was to be removed and a storm water collection inlet placed. Additional quantities of the piping were removed than originally planned due to the poor condition of the pipe. The storm water inlet location was moved to accommodate this change.

7.0 CERTIFICATION

I, David R. Lutz and Blaine A. Litteral, Professional Engineers licensed in the State of Michigan, certify[1] that, NTH Consultants, Ltd. and E&E Solutions have reviewed the visual documentation, the survey data, and prepared this certification report for the Coal Yard Closure at Holland Board of Public Works James DeYoung Power Plant in Holland, Michigan as presented above. To the best of my knowledge and belief, the information presented in this report for the Coal Yard Closure at the aforementioned facility has been prepared in substantial conformance the requirements established in conformance with Part 115 of the Natural Resources Protection Act, 1994, PA 451 as amended, and the MDEQ approved Coal Yard Closure Plan – Coal Removal Visual Documentation Procedure, subject to the modifications identified in this report.

8/31/18

David R. Lutz, P.E.
State of Michigan Professional Engineer
Registration No. 57487

9/4/18

Blaine Litteral, P.E.
State of Michigan Professional Engineer
Registration No. 36551

[1] I am rendering my professional opinion based on the information available to me at the time of this report writing. This certification does not comprise a guarantee or warranty that certain conditions exist, nor does it relieve any other party of their requirements to abide by all applicable, local, state, and federal regulations, and to honor all express or customary guarantees and warranties associated with their work.

APPENDIX A

FIELD AND PHOTOGRAPH REPORTS

NOTE: COAL YARD AND CCR IMPOUNDMENT AREA WORK ARE DOCUMENTED IN THE FIELD REPORTS AS THE WORK WAS PERFORMED CONCURRENTLY

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 7/25/2017

Time Arrived: 10:00 Time Left: 12:00 Page: 1 of 1

Weather: clear Precipitation: none Temp: 80 °F

Personnel on Site

Owners:	HBPW
Contractors:	Ryan Inc, Rob Koski
Contractors:	
CQA:	E&E Solutions
Other:	

Summary of Construction Activities

Usable coal from coal yard previously stockpiled and screened is being loaded onto ship for sale.

Summary of CQA Activities

Site visit, observation of areas to be affected during project

Notes:

Site visit after pre-construction meeting

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 7/28/2017

Time Arrived: 9:00 Time Left: 2:00 Page: 1 of 1

Weather: clear Precipitation: none Temp: 80 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Mitch Stark & Kurt VanAppledorn
Other:

Summary of Construction Activities

Summary of CQA Activities

Determined coal depth in several locations with pickaxe, shovel, and measuring tape, surveyed coal yard and benchmarks

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 8/10/2017

Time Arrived: 9:50 Time Left: 10:20 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 65 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Blaine Litteral, Mitch Stark
Other:

Summary of Construction Activities

Coal over the concrete pad has been stockpiled and cleared. Coal on south end was being stockpiled as well. Estimated between 4,000-5,000 tons of coal to be piled up at completion of clearing.

Summary of CQA Activities

Took pictures of site and estimated amount of coal.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 8/11/2017

Time Arrived: 10:00 Time Left: 11:15 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

Coal piles and remaining usable coal from yard combined into existing pile on north end.

Summary of CQA Activities

Surveyed coal pile to estimate volume.

Notes:

Approximately 4,000 tons of coal in pile.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 8/18/2017

Time Arrived: 10:00 Time Left: 12:45 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

Summary of CQA Activities

Surveyed coal yard on grid points to use in comparison with coal yard after coal/soil removal.

Notes:

Survey represents pre coal/soil removal surface.

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 8/21/2017

Time Arrived: 10:00 Time Left: 12:15 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 70 °F

Personnel on Site

Owners:	Jane Monroe, Andrew Reynolds, Theo VanAken
Contractors:	Ryan Inc, Rob Koski
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	

Summary of Construction Activities

More coal was excavated from the yard and added to the existing piles.

Summary of CQA Activities

Surveyed pile for new volume after more was added. Surveyed additional grid points to use for comparison.

Notes:

Approx. 4600 tons in piles now. Weekly progress meeting occurred.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 8/25/2017

Time Arrived: 9:30 Time Left: 10:15 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 70 °F

Personnel on Site

Owners:	HBPW: Andrew Reynolds
Contractors:	Ryan Inc, Rob Koski
Contractors:	
CQA:	E&E Solutions, Mitch Stark, Kurt VanAppledorn
Other:	Pitsch Co (subcontractor to Ryan) on site for demolition of conveyor

Summary of Construction Activities

Beginning to excavate CCR from south and east, and stockpiling it up to be hauled away.Beginning removal of conveyor by Pitsch. Pitsch started to cut away sections of conveyor and work on inside area.

Summary of CQA Activities

Site observation, survey of drone targets and Ryan's control points. Kurt flew the drone and collected aerial images of the site.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 8/28/2017

Time Arrived: 2:00 Time Left: 3:45 Page: 1 of 1

Weather: cloudy Precipitation: slight rain in morning Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Blaine Litteral, Mitch Stark
Other: Pitsch

Summary of Construction Activities

Continuing to excavate CCR area and coal yard, and stockpile for disposal. Pitsch continued to work on removal of conveyor. Part of the storm pipe running north/south on southwest of site was uncovered and found to be corroded and damaged. RFI #1 was created to deal with this issue.

Summary of CQA Activities

Surveyed manholes and pipe that was uncovered, more grid points to use for volume comparison.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 8/29/2017

Time Arrived: 3:50 Time Left: 4:20 Page: 1 of 1

Weather: clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Pitsch

Summary of Construction Activities

Continuing to excavate and stockpile coal and CCR, and create separate piles for each. Pitsch continued removing conveyor parts. Uncovered more of storm water pipe and manhole in southwest of site that was found yesterday for further inspection. Hauling of materials to landfills to begin tomorrow. Reminder to crew that dust control must be done when trucks arrive. They will spray down the coal road to avoid dust.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/5/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:	Jane Monroe, Andrew Reynolds, Theo VanAken, Fred Heiser
Contractors:	Ryan Inc
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	Pitsch Co.

Summary of Construction Activities

Most of the ash has been excavated from pond 1 area. Continuing to pile CCR and CCR/soil mix as well as coal from yard and ponds. CCR material trucked to Ottawa County Farms Landfill and coal material to Zeeland Township Landfill. Conveyor pieces still being removed and disposed of.

Summary of CQA Activities

Site visit and observation of coal and CCR areas.

Notes:

Weekly progress meeting occurred.

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/6/2017

Time Arrived: 4:00 Time Left: 4:30 Page: 1 of 1

Weather: clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Pitsch

Summary of Construction Activities

Continuing to excavate and pile CCR and coal, and hauling to Coopersville landfill and Zeeland landfill. Pitsch continuing to remove broke conveyor pieces and concrete.

Summary of CQA Activities

Site visit and observation of coal and ash areas.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/8/2017

Time Arrived: 4:00 Time Left: 4:30 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Pitsch

Summary of Construction Activities

Continuing to excavate, pile and haul CCR and coal. Conveyor parts and concrete being removed still by Pitsch. Building near ponds was demolished and disposed.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/11/2017

Time Arrived: 10:00 Time Left: 11:15 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 65 °F

Personnel on Site

Owners:	Jane Monroe, Andrew Reynolds, Theo VanAken, Fred Heiser
Contractors:	Ryan Inc., Rob Koski
Contractors:	
CQA:	E&E Solutions, Blaine Litteral
Other:	

Summary of Construction Activities

Continuing to haul CCR and coal. Approx. 35 loads of CCR to Ottawa County Farms Landfill and 5 loads to Zeeland Landfill. Stripped nearly all of pond 1 of surrounding vegetation. Monitoring well 3, in between ponds 1 and 2 found to be in several feet of ash, to be removed this week.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Weekly progress meeting occurred.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/12/2017

Concrete remaining after conveyor removal

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/12/2017

Time Arrived: 4:15 Time Left: 4:45 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc.
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Pitsch

Summary of Construction Activities

No hauling today, continuing to pile CCR. Continuing to break up concrete from conveyor and remove material for disposal. Screened coal pile was moved from south end and joined with other coal pile on North end. Monitoring well MW-3 was removed, and filled with bentonite.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/13/2017

MW-3 after removal

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/13/2017

Time Arrived: 3:30 Time Left: 4:15 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:	Andrew Reynolds
Contractors:	Ryan Inc.
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	Pitsch

Summary of Construction Activities

Piling CCR material into one large pile where screened pile used to be. While pitsch was removing concrete, a 48" steel storm water pipe was damaged and a leak sprung. It was filled by Ryan with a 4x4 block of wood and surrounded by hydraulic cement for now. RFI will be made to inquire about a longer term solution.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

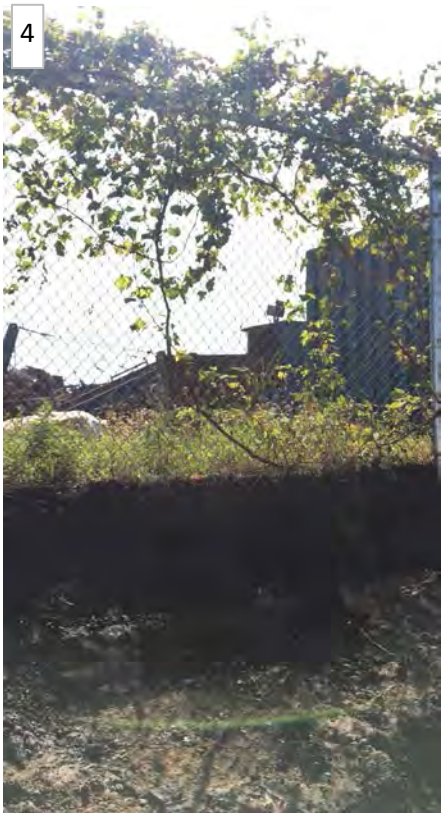
Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/15/2017

1

2

3

4



5

1. CCR Pile on south end
2. CCR Pile on north end
3. Sand placed over concrete on pipe patch
4. Fence line soil profile, south fence
5. auto fluff found along south fence

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/15/2017

Time Arrived: 1:30 Time Left: 2:30 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners: HPBW
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark, Kurt VanAppledorn
Other:

Summary of Construction Activities

Continuing to pile CCR material and haul to Coopersville. Some coal will be transported to Zeeland at the end of the day if time available. Reminded Ryan crew to keep spraying and sweeping coal roads for dust prevention.

Summary of CQA Activities

Site visit and observation of construction activities. Tested south border along fence to see if coal/ash extends into the Padnos property.

Notes:

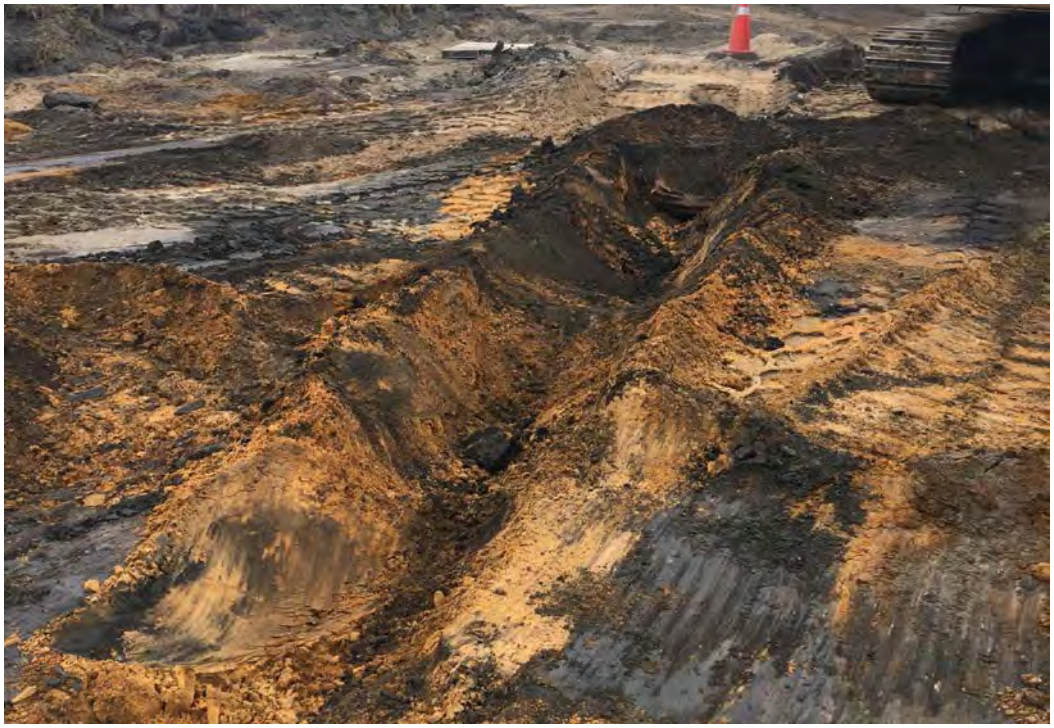
The coal/ash extends about 1.5 feet past the fence towards Padnos, which is probably still on BPW property, but the property line has not been determined by a professional surveyor. Would be a good idea to talk to Padnos and see what they think about removing the fence to clean up that area.

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/18/2017



Metal storm pipe being removed on west side of coal yard

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/18/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:	Andrew Reynolds, Theo VanAken
Contractors:	Ryan Inc., Rob Koski
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	

Summary of Construction Activities

Found 9 culverts, 8' long, in the ground that were removed and disposed of. The corrugated metal storm water pipe running east to west on the south border was removed, along with the connecting section running north to the manhole that was previously uncovered. Metal was disposed of. CCR was piled and hauled.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Weekly progress meeting occurred. Notes- talk to Padnos about fence removal in order to excavate coal in that area, get approval on fill sand so it can be stockpiled, keep running CCR to Coopersville and coal to Zeeland if there is time. Hopefully have results back on coal pile for sale by the end of the week.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/19/2017

Time Arrived: 4:45 Time Left: 5:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 80 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark.
Other:

Summary of Construction Activities

Continued to haul CCR material and coal. Finished removal of storm pipes from yesterday. Planning on filling in conveyor hole with flowable fill tomorrow to prevent gaps when filling with sand.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/20/2017

1

2

3

1. Hopper hole starting to be filled with flowable fill
2. Cement truck filling hole
3. Hole mostly filled

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/20/2017

Time Arrived: 8:45 Time Left: 10:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Brewer's had 3 cement trucks bringing flowable fill from Zeeland

Summary of Construction Activities

Conveyor hole filled with flowable fill up to floor elevation. 7 trucks brought in 60 yards of flowable fill, and it was dumped in the hole. Concrete remaining around conveyor area was broken up and cleaned. CCR material continued to be stockpiled and hauled to Coopersville.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/21/2017

1

2

3

4

1. Sand starting to be filled in hopper hole, previously filled with flowable fill.
2. Drain pipe from plant found, looking south near conveyor area
3. Concrete manhole found, near pipe
4. Another piece found for removal, near manhole and pipe

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/21/2017

Time Arrived: 2:30 Time Left: 3:30 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 90 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

Hauling CCR material to Coopersville. Getting close to being done hauling material. Conveyor hole was filled in with sand (from approved sand pit sampled two weeks prior) on top of flowable fill. More storm pipes were uncovered running south from the bulding, near the old conveyor area.

Summary of CQA Activities

Site visit and observation of construction activities. Survey of CCR limit to determine which areas must be tested for CCR material upon completion and which much be visually inspected for coal removal.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/22/2017

Sand filling the hopper hole, looking east from the west side of hole

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/22/2017

Time Arrived: 10:00 Time Left: 10:20 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 85 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., 1 operator
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

More sand was filled in conveyor hole, up to existing ground level. No hauling today, just site cleanup and filling with the sand.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/25/2017

Time Arrived: 2:00 Time Left: 2:20 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 88 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

Just one truck hauling CCR to Coopersville. Found some more coal material, so it was piled up in the southeast side of the site. More sand was delivered to use in ditch along south fence and to fill ponds that were created by removing material. Conveyor hole now filled in completely with sand.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/27/2017

View of site and sand stockpile looking south

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/27/2017

Time Arrived: 10:00 Time Left: 10:20 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

Upon confirmation that the coal will not be shipped out by boat, Ryan began to pile it on the concrete pad so they can continue to clean the coal yard. Using a loader, they took coal from the south end of the pile and moved it to the north end, on top of the concrete. It will be screened into another pile, also on the concrete, before being shipped.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/28/2017

pieces found in soil for removal near center of site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 9/28/2017

Time Arrived: 2:00 Time Left: 2:20 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

The coal has now been completely piled on top of the concrete. Ryan began to excavate the coal yard where the pile used to be, piling it with a loader south of the old coal pile to be hauled to the zeeland landfill.

Summary of CQA Activities

Site visit and observation of construction activities. Surveyed the fence line so that the fence can be replaced in the same location following removal and cleanup of the soil underneath.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/2/2017

Hopper hole filled with sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/2/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:	Andrew Reynolds, Theo VanAken
Contractors:	Ryan Inc., Rob Koski, operator
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	Professional Surveyor

Summary of Construction Activities

The professional surveyor came to survey the exact property line for determining placement of the fence once it is torn down and replaced. An area of slag was found in the southeast corner of the site, and exposed to be excavated at a later time. The grass area is to be explored today to determine the extent of CCR material in that direction. The 20" pipe by the ponds is to be capped as well.

Summary of CQA Activities

Site visit, observation of construction activities.

Notes:

Weekly progress meeting occurred. Discussed plans for screening and hauling of coal, to begin on Thursday hopefully. The fence crew is expected to begin removing the fence along the south property line this week as well, and Ryan will begin to excavate coal and CCR material once the fence is removed.

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/3/2017

Site overview

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/3/2017

Time Arrived: 11:30 Time Left: 1:45 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors:
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other:

Summary of Construction Activities

The screen to be used on the coal pile was delivered to the site and set up, as well as another conveyor to assist in piling of the screened coal. The screen was set up, to be filled with a loader, which will drop screened coal onto the conveyor, carrying it further away and dropping it into a pile.

Summary of CQA Activities

Site visit, observation of construction activities. Verification of coal and CCR removal began. I surveyed each testing point required in the area chosen for verification then took a picture of the soil with a 1' wide, 10x10 square grid placed over the soil at each point (Appendix A). I then collected a sample at the required points in the historical CCR area to be tested for metals. A description of the soil at each point was written as well.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/4/2017

Ash found near slag pit to be removed

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/4/2017

Time Arrived: 11:45 Time Left: 3:00 Page: 1 of 1

Weather: cloudy Precipitation: slight rain Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors: Brewers to screen coal, one operator
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

Brewers was placing coal into the screen using a loader. The screened coal was piled on the concrete pad next to the original pile. Trucking of the coal began as well, again using the loader to dump coal into the truck.

Summary of CQA Activities

Site visit, observation of construction activities. Continued observation of coal and CCR removal. I surveyed each testing point required in the area chosen for observation then took a picture of the soil with a 1' wide, 10x10 square grid placed over the soil (Appendix A). I then collected a sample at the required points in the historical CCR area to be tested for metals. A description of the soil at each point was written as well.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/5/2017

Time Arrived: 2:00 Time Left: 2:45 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors: Brewers, one operator
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other: Fence Crew

Summary of Construction Activities

The fence on the south border of the property was removed. The fence material was taken off, and the fence posts and concrete anchors were removed. Ryan removed the CCR material from the slag area and coal from various small points around the site that were found during observation and added them to their respective piles for disposal. Coal continued to be screened and loaded in to trucks for hauling.

Summary of CQA Activities

Site visit, observation of construction activities. Collected two CCR samples (4068 and 4078) for testing.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/6/2017

Screened coal pile (top) and unscreened coal remaining (bottom)

Fence posts after removal

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/6/2017

Time Arrived: 11:00 Time Left: 11:15 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors: Brewers, one operator
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

With the south fence removed, Ryan began to excavate the coal and CCR material from the property line. Coal continued to be screened and loaded in to trucks for hauling.

Summary of CQA Activities

Site visit, observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/9/2017

Time Arrived: 10:00 Time Left: 12:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 72 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

East of the existing access road, just south of the site entrance, Rob demonstrated fly ash may be present in the berm by digging a test pit three feet deep with an excavator. At the southwest corner of the site, excavation along the property line to determine where top soil and remaining fly ash separates was continuing. Iron and other miscellaneous materials from Padnos were present in the excavated soil. Some small coal pieces were also present. At the material stockpile location, coal was being sorted and trucked out.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/10/2017

Area near south fence found to have CCR material and excavated

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/10/2017

Time Arrived: 1:15 Time Left: 2:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 65 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors: Brewers
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other:

Summary of Construction Activities

Coal material was hauled to the Zeeland landfill, and screened coal was hauled to Morton by Brewers. Both were loaded in trucks with a loader. The area along the south border has now been cleaned enough by Ryan for verification.

Summary of CQA Activities

Site visit, observation of construction activities. Verification of clean closure for points 4216, 4128-29, 4130-45, 4152-61, 222-225, and 238-240 was done visually, and samples for metal testing were taken at points 4126, 4128, 4140, 4144, and 4157. The points were surveyed and photographed, and those that required samples (4144, 4128, 4157, 4140, and 4126) had a jar of the soil material collected and delivered to the lab for testing.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/11/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: Rainy Precipitation: 2" rain Temp: 65 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors: Brewers
CQA:
Other:

Summary of Construction Activities

No construction activities other than loading coal with a loader into trucks for Brewers to haul. Pumps were placed around the site to help with water drainage.

Summary of CQA Activities

none

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/12/2017

Excavation of manhole by hydro excavators

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/12/2017

Time Arrived: 1:15 Time Left: 2:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 65 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors: Brewers
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other:

Summary of Construction Activities

Pumps were placed around the site to attempt to drain some of the water from the previous days' rain. Hydro excavator was on site, excavating the material around the dredge pipe manhole in the north end of the site near the conveyor area. They also excavated around the transformer. Brewers continued to truck coal to Morton salt, loaded in the truck with a loader.

Summary of CQA Activities

Site visit, observation of construction activities. The plan was to verify points in the center of the site, but there was too much flooding from the rain and coal pieces that had been washed into the cleaned area, it will be re-cleaned next week.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/13/2017

Excavation of slag area in southeast of site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/13/2017

Time Arrived: 11:15 Time Left: 1:45 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 65 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors: Brewers
CQA: E&E Solutions, Mitch Stark, Amy Mandrell, Blaine Litteral
Other:

Summary of Construction Activities

Coal was loaded into trucks with a loader and trucked off site. The slag area was cleaned out in the southeast of the site. Ash and cinders were found in the pit, so it was further excavated using an excavator, until it was down to the natural clay material. The CCR material was piled for disposal with a loader and a skidsteer. The area was cleaned up further with the skidsteer, then filled in with sand using a loader. The loader was washed with the water truck to remove all coal and CCR debris before beginning to fil sand. The pit was filled in immediately after certification and testing to prevent it from filling in with water.

Summary of CQA Activities

Site visit, observation of construction activities. Verification of points 196-198 and 214-216 was done visually, and a sample was taken at point 196 to be tested for metals. The test points were surveyed, as was the slag pit after the CCR material was removed.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/16/2017

Flooding on site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/16/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 60 °F

Personnel on Site

Owners:	Andrew Reynolds, Theo VanAken, Fred Heiser
Contractors:	Ryan Inc., Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	

Summary of Construction Activities

Heavy flooding from over 5" of rain over the weekend. Today will consist of pumping water from the site into the ponds, and discharging the ponds from the weir following sampling and approval by the wastewater plant. All coal has been delivered off site as of Friday afternoon.

Summary of CQA Activities

Site visit, observation. Placed two stakes at the sampling points which required further excavation, points 4026 and 4040.

Notes:

Weekly progress meeting occurred. The plan for the week is to drain the site, verify the remaining points for coal removal, and start to fill with sand. The west fence will come down this week as well to allow for excavation of the coal underneath.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/17/2017

Time Arrived: 9:45 Time Left: 9:50 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 60 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., 1 operator
Contractors:
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other:

Summary of Construction Activities

There is still large amounts of water on site. Today will again consist of pumping water from the site. The west fence will be removed today as well.

Summary of CQA Activities

Site visit, observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/19/2017

Time Arrived: 12:00 Time Left: 15:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 62 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Area of ponded water from rainfall earlier in the week was being pumped (points 205, 206, and surrounding area). Operator cleaned up top layer for points 221, 204-210, 4128 to be surveyed using skidsteer. Additional fence along west side of property was taken down. One operator was cleaning the southwest corner of the property with a skidsteer. Sand was being delivered to site and spread around point 152 and surrounding area by Rob.

Summary of CQA Activities

Site visit and observation of construction activities. Verification/surveying of points 221, 204-210, 4128, and 186-192. Couldn't get data for points 205 and 206 - both were located in ponded water. No samples were taken.
Created/surveyed points 7512-7516 for stakes along property line as established by the licensed survey (Westshore Engineering) at Owners request.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/20/2017

Time Arrived: 1:31 Time Left: 4:41 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 76 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions,Amy Mandrell
Other:

Summary of Construction Activities

2 operators were cleaning southwest corner with a skidsteer and excavator. Multiple loads of sand were delivered. 1 operator spread sand throughout approved area as stakes were put in. Water was being pumped in various ponded areas.

Summary of CQA Activities

Site visit and observation of construction activities. Took retest samples at points 4068 (As and Cd) and 4078 (As). Used pink flags to mark eastern ash line at Rob's request (marked points 4006, 63, 4035, 4046, 4068, 4096, and 4148). Staked points 129, 147, 180, 232, 245, 4161, 4157, 240, 221, 186, 192, and 156 - area within these stakes are clean. Gave Rob a copy of CAD drawing with these points circled and area highlighted.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/25/2017

Flooding on site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/25/2017

Time Arrived: 10:20am Time Left: 10:50am Page: 1 of 1

Weather: Clear Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions,Amy Mandrell
Other:

Summary of Construction Activities

3 operators were tearing down fence along west perimeter of site. Pumping from the site after 2 1/2 days of rain. Pumping from existing ponds 2 and 3, as well as in the approximate area of points 95-173.

Summary of CQA Activities

Site visit, observation of construction activities. No stormwater runoff from site observed.

Notes:

One contractor noted approved area was graded to 6" above lake level and it was still ponded after 2 1/2 days of rain.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/26/2017

Electrical conduit after removal and during backfill

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/26/2017

Time Arrived: 13:15 Time Left: 14:50 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 52 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions,Amy Mandrell
Other:

Summary of Construction Activities

Continued pumping water from the site after previous weekend rain. Fence has been completely taken down along west perimeter of site. Had already excavated/cleaned up area along fence up to point 121. Were working on excavating further down fence around points 4107 and 4108. Plan to truck excavated material away from site tomorrow. Tore up part of the electrical conduit that runs along the fence and filled in with sand (estimated by Rob to be 2 1/2 to 3 feet deep and 18" wide).

Summary of CQA Activities

Site visit, observation of construction activities. Took survey points 9000-9010 along both sides of the torn up electrical conduit at Rob's request. Surveyed sea wall and concrete structures along it (points 8000-8055, 8131-8161).

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/30/2017

Time Arrived: 1:45 Time Left: 3:30 Page: 1 of 1

Weather: Cloudy, Windy Precipitation: Rain Temp: 44 °F

Personnel on Site

Owners:
Contractors: Ryan Inc.
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

No construction activities today. Too wet to deliver sand or soil. Plan to continue pumping rest of the week.

Summary of CQA Activities

Weekly meeting, site visit. Surveyed buried concrete (points 8057-8130) and east of lagoons/edge of road (points 9000-9010). Will need to create more certification points in the southwest corner, along western edge, and in the northeast corner.

Notes:

Weekly meeting: top soil was approved last week; discussed high levels of arsenic that have been observed in the results for CCR samples; dewatering permit expected Nov. 1st.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/31/2017

Pump house sitting on a layer of coal

Excavated areas along western concrete wall

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 10/31/2017

Time Arrived: 12:36 Time Left: 1:30 Page: 1 of 1

Weather: Cloudy Precipitation: Light rain Temp: 39 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Pumping and excavating top layer of about 2' along western concrete wall. Western pump house is sitting on top of coal - Rob would like to remove this pump house. Concrete throughout this area also appears to be sitting on a layer of coal. Plan for tomorrow is to have a small area to the west of certification point 196 ready for visual approval.

Summary of CQA Activities

Site visit. Area between fence and concrete wall seems to have coal present but no fly ash, based on visual observation and excavation of 1-2' along wall.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/1/2017

Excavation/Backfill of coal between certification points 134 and 107

Excavation/Backfill of coal near point 81

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/1/2017

Time Arrived: 8:40 / 4:50 Time Left: 9:40 / 6:00 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 36/42 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Excavated a deep hole near point 120 and backfilled with sand right away as it was filling up with water. Excavated another deep hole filled with coal around point 81 and backfilled with sand right away. Removed light pole and pump house. Sand was being delivered, and coal-soil removed. Operators were working on cleaning up an area along the Southwest property line using various equipment (excavator, skidsteer, loader) .

Summary of CQA Activities

Observed while the deep coal spots were excavated and approved them as clean prior to sand backfill. Visually approved and surveyed points 4113, 150, 133, 148, 164, 183, 201, 218, and 233.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/2/2017

Area being cleaned in southwest corner

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/2/2017

Time Arrived: 1:37 Time Left: 4:30 Page: 1 of 1

Weather: Cloudy Precipitation: Light rain Temp: 52 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operator
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

All three operators worked on clearing the southwest corner of CCR material using various equipment (skidsteer, excavator, loader). No sand deliveries due to precipitation.

Summary of CQA Activities

Sampled and surveyed points 4109, 4114, 4117, 4118, 4120, 4123, 4124, 4167. Visually approved and surveyed points 134, 249, and 250. Pictures and elevation of points 134 and 250 were taken slightly to the west of each point due to concrete.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/3/2017

Southwest corner being cleaned

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/3/2017

Time Arrived: 1:15 Time Left: 3:15 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 49 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Sand was delivered in several loads and spread over approved area to the east of points 192 and 156 using a Caterpiller D6 Dozer. Southwest corner was further cleaned with excavator and skimmed with skidsteer. Continued to clean north of points 4114 and 4118 using the same equipment. Contaminated soil was transported to the large buried concrete pad using a loader to be trucked off site. Continued to pump water in various areas.

Summary of CQA Activities

Surveyed and visually approved points 4166, 4125, 4121, and 4119 (no samples needed). Staked points 186, 4118, and 4114 - Rob said they would lay sand up until this line in the southwest corner.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/6/2017

Area between points 4115 and 4110 being excavated

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/6/2017

Time Arrived: 9:50 Time Left: 12:25 Page: 1 of 1

Weather: Clear, sunny Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Area prone to ponding on west side (between points 4110 and 4118) was cleared of CCR with excavator and skidsteer for approval. Coal-soil was being removed and trucked off site. Sand was removed and replaced after visual approval at points 168-170, as sand had been placed on these three points without them being approved. Skidsteer was used to clean off the top mud-layer (due to rain) of already approved points in approximate area of points 4068-4048 so that the area could be covered with sand by the dozer. The area to the north of these points was being cleaned at time of visit with a skidsteer and excavator, and should be ready for sampling/approval tomorrow.

Summary of CQA Activities

Observed while area between points 4110 and 4118 was cleared of CCR with excavator - area is prone to ponding water. Points 4110, 4112, and 4115 from this area were visually approved. Sand had been placed on top of points 168, 169, and 170 without approval, so sand was removed and points were visually approved so that sand could be replaced. Staked points 129 and 130.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/7/2017

Approved areas being backfilled with sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/7/2017

Time Arrived: 9:50 Time Left: 1:15 Page: 1 of 1

Weather: Clear, sunny Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Sand was delivered in several loads and was being spread with the dozer in the south approved area. Contaminated soil was being removed and trucked off site. One operator followed with excavator as points were approved to further clean area of coal, cinders and ash as needed. Plan to cover points that were approved today with sand by end of day using the dozer.

Summary of CQA Activities

Visually approved points 62, 63, 76, 77, 89, 90, 4035, 4036, 102, 127, 4049, 4060, 4061, 4071, and 4084. Sample was taken at point 4084. Point 4049 had an excess of cinders present so it was staked for further excavation. Points 116, 128, and 141 were flagged but operators said they were located where the foundations of the conveyor belt used to be and there is ~20 foot of sand and flowable fill backfilled in this area.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/8/2017

Sea wall filled with rip rap

Approved areas being backfilled with sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/8/2017

Time Arrived: 11:30 Time Left: 1:15 Page: 1 of 1

Weather: Clear, sunny Precipitation: None Temp: 46 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Sand was delivered in multiple loads and spread throughout the approved mid-area using the Caterpiller D6 Dozer. The sea wall was filled with 4" rip rap and 40-50 yards of flowable fill (Brewer's City Dock, Inc. W-bag). Material from crushing one of the concrete structures/pads (located near the sea wall) was also used as fill. Ryan Inc. cleaned the north portion of the coal-ash area (near the building) with an excavator and placed sand on the approved area from this morning's CQA visit.

Summary of CQA Activities

Site visit and observation of construction activities. Visually approved points 4002, 4003, 4007, 4008, 4009, 4016, and 4025. Samples were taken at points 4009 and 4025. Points 4037, 4026, 4017, and 4018 were flagged but not yet cleaned so did not approve.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/9/2017

Approved area covered with sand layer

Point 199 / Portion of area cleaned with skidsteer

Soil being layered on top of sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/9/2017

Time Arrived: 12:30 Time Left: 2:20 Page: 1 of 1

Weather: Cloudy,windy Precipitation: Very light rain Temp: 37 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Southeast corner along concrete walls has been cleared of CCR and was ready for approval. At time of visit, points 4089 and 4090 were being cleaned with an excavator. Soil was delivered in several loads and spread on top of sand in a portion of the southwest approved area using a dozer. Plan to continue spreading sand top soil over planned areas for rest of the day.

Summary of CQA Activities

Approved points 4093, 4096, 4100, 246, 247, 248, 4146, 4147, 4148, 4162, and 4163 visually. Took a sample at point 4096.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/10/2017







Approved areas being covered with top soil

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/10/2017

Time Arrived: 11:20 Time Left: 1:10 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 27 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Soil layer was placed on top of sand in several locations using the dozer: along the sea wall, and on the approved area just west of the lagoons. Soil was delivered in several loads to be spread over these locations. Plan to continue spreading tomorrow (Saturday 11/11) and to tee water pipe sometime next week.

Summary of CQA Activities

Site visit, observation of construction activities. Approved verification points 41-42, 54-55, 67-68, 81-82, 93-94, 107, and 120 visually for backfill. Samples were not necessary for these points for approval.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/13/2017

Sand being layed in NE approved corner

Coal area just south of buried concrete being cleaned and approved

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/13/2017

Time Arrived: 1:30 Time Left: 3:50 Page: 1 of 1

Weather: Cloudy, windy Precipitation: None Temp: 41 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Northeast corner of the ash area was further cleaned for approval of points 4017, 4018, and 4026 using an excavator. Sand was delivered in several loads and placed on top of certification points just to the west and south of these points (approximately points 4007, 4016, 4002, 4003, 4035, 4036, 4047-4049) using a dozer. Points 85-86 and 98-99 were being cleaned for approval tomorrow using an excavator and skidsteer. Soil was being stockpiled to create a berm for over the winter to divide approved areas from non-approved ash area. Don't plan to work Friday 11/17.

Summary of CQA Activities

Site visit, observation of construction activities. Approved certification points 4026, 4017, 4018, 137-139, 122-125, 110-112, 96-97, and 84. Samples were taken at points 4026 and 4018. Looked at manhole and storm pipe near outlet and discussed beehive/fantail options.

Notes:

Weekly meeting was held today. Coal area will be finished for approval tomorrow, excluding the road. Road will be cleaned and ready for approval later this week. Plan to clean concrete pad/buried concrete before pausing for the winter. Discussed whether sand should be placed on top of concrete over winter or not. Also discussed other steps (i.e. what equipment will be stored on site) to be taken prior to halting for the winter. Fence should be in by 12/1.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/13/2017




Overview of the site



Teeing of leaking storm sewer pipe at the northwest corner of the storm junction box

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/14/2017

Time Arrived: 12:30 Time Left: 3:30 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Soil delivered and spread over east portion of approved area via dozer. Coal-soil was pushed onto buried concrete for approval of points south of the pad. Had southern coal-portion of road cleaned and ready for approval upon arrival. One operator, using an excavator, was clearing CCR material from around the manhole near the outfall to Lake Macatawa. Installed PVC pipe with fitting to old storm sewer pipe that had been leaking at the northwest corner of the storm water junction pipe. Old pipe was cut and fitted with a 6" CI/Plastic to 4" CI/Plastic fitting. A 4" PVC Type 1 ASTM D 2665 was then placed into the other end of the fitting. Currently have pipe temporarily tied to adjacent concrete storm structure to hold up - plan to get screws to hold pipe to building as a permanent solution. Also plan to finish pipe fitting and clean the corner near the building (points 4006,4001) tomorrow.

Summary of CQA Activities

Site visit and observation of construction activities. Approved points 70, 85-86, 99-100, 113, 140, 135-136, 151-155, and 171-173. Took sample, picture, and elevation at point 4089 - staked this point for reference. Plan to overlay aerials onto certification grid to ensure points 116, 128, and 141 are over the concrete foundation (filled with approximately 20 ft of sand on top) from when the conveyor was removed. Observed and documented through pictures while leaking pipe was fitted with a tee.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/15/2017

No construction activities past noon due to rain. Pictures of site from buried concrete

Uncovered concrete pad located between points 4001 and 4002

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/15/2017

Time Arrived: 12:00 Time Left: 12:15 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 45 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Worked a half day. No construction activities past noon due to rain other than pumping of water. Had Andrew from HBPW come during the morning to look at unlabeled concrete pad (located between certification points 4001 and 4002) not marked on plans, and leaking water pipe. Spread sand on approved areas until it was too wet to continue using a dozer. Began process of cleaning concrete pad free of coal.

Summary of CQA Activities

Site observation. No observable stormwater runoff exiting site.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/16/2017



Overview of site



Gate Valve being placed on leaking storm pipe just east of the large concrete pad

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/16/2017

Time Arrived: 11:00 Time Left: 1:45 Page: 1 of 1

Weather: Cloudy Precipitation: Rain/Snow mix Temp: 37 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Had more of the road cleaned of CCR material and ready for approval upon arrival. Continued to lay sand on east portion of approved area with the dozer. Sand was delivered in several loads. On-site equipment were being cleaned with high pressure water as part of routine maintenance. Operators continued to clean buried concrete slab by removing some of the coal layer covering it with the skidsteer. Area under concrete pad discovered yesterday (located between points 4001 and 4002) was pumped free of water. Once drained, the end of the leaking storm pipe was set with a Valterra 4"/110 mm gate valve. The hole was then filled with newly delivered sand by an expeditor. Plan to wrap up early today (3 pm) and will be taking tomorrow off.

Summary of CQA Activities

Site visit and observation of construction activities. Flagged and visually approved points 4001, 4006, 114, 126, 56, 69, 95, 108-109, and 121. Flagged but did not approve points 101, 115, 141, and 83. Areas were either too muddy or not cleaned enough for approval. Observed and documented through pictures while area under concrete pad was pumped free of water, and while leaking end of water pipe was plugged. Surveyed concrete pad (pts 2000-2005), gate valve (pt 2006), and various depths of the hole (pts 2007-2018) in order to determine amount of sand used to backfill area. No observable stormwater runoff exiting site from this weeks storm events.

Notes:

From Rob Koski: ash hauling totals for year 18,140,07 tons hauled to Ottawa Landfill (no more there hauling this year); Through Friday, Nov 10th there is Coal Yard fill = 8,984 tons received and placed. Coal material was trucked to Zeeland Township Landfill.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/10/2017

Time Arrived: 11:20 Time Left: 1:10 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 27 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Soil layer was placed on top of sand in several locations using the dozer: along the sea wall, and on the approved area just west of the lagoons. Soil was delivered in several loads to be spread over these locations. Plan to continue spreading soil tomorrow (Saturday, 11/11) and to tee water pipe sometime next week.

Summary of CQA Activities

Site visit, observation of construction activities. Approved points 41-42,54-55, 67-68, 81-82,93-94, 107, and 120 for backfill.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

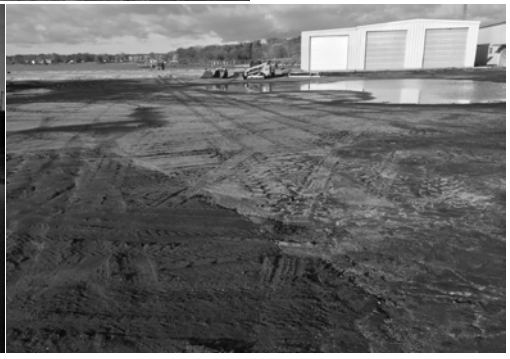
Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/20/2017





Sand being spread in approved area north of concrete storm structure





Ponding of water from past weekends rain and cleaning of buried concrete

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/20/2017

Time Arrived: 9:45 / 2:45 Time Left: 11:15 / 3:15 Page: 1 of 1

Weather: Sunny Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Pumping of water from this past weekend's rain. Cleaning of buried concrete using skidsteer. Continued to spread sand over approved points (4025 and 4026, and 4037) surrounding concrete storm structure using dozer. Continued to stockpile sand along approved area's boundary for use in the spring. Plan to pump water and have remaining area ready for approval within next two days.

Summary of CQA Activities

Site visit and observation of construction acitivities. No areas ready for approval today.

Notes:

Rob would like an estimate of the amount of sand that covers the coal area, as well as an estimate of the amount of sand needed to store for coverage of remaining ash area in spring.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/21/2017

Pictures from today's site visit

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/21/2017

Time Arrived: 11:15 Time Left: 12:15 Page: 1 of 1

Weather: Cloudy, windy Precipitation: Rain Temp: 43 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Pumping of water from this past weekend's rain continued. Sand was delivered in several loads, and is being stockpiled near points 4001-4006 to be used in the spring. Surface of already approved area 135-139, 121-125, 95-100, and 82-86 was skimmed so that sand and top soil can be layered on top tomorrow via dozer. Goal is to get rest of coal area ready for approval by end of next week.

Summary of CQA Activities

Site visit and observation of construction acitivities. Verified point 83. Staked points 141 and 115 for excavation either tomorrow or next week. No other areas ready for approval today. Retook pictures of already approved points 56, 70, 84, 85, and 112 for better viewing, as they did not turn out well due to rain last week. Goal is to get rest of coal area approved by end of next week.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/22/2017

Stockpiles of sand and soil

Areas being covered withtop soil and sand

Norhtern portion of buried concrete being cleaned

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/22/2017

Time Arrived: 9:10 / 12:05 Time Left: 10:10 / 1:30 Page: 1 of 1

Weather: Cloudy, windy Precipitation: Rain Temp: 30 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Continued to pump stormwater and stockpile sand for spring. Began cleaning of the north end of the large buried concrete pad. Excavated coal from this will be trucked out Monday. Have small buried concrete pad clean - free of coal and power washed. Plan to have a few more points ready for approval this afternoon. / Afternoon: Area surrounding final points had been excavated and were ready for approval. One operator continued to work on cleaning up large buried concrete pad via skidsteer, and another continued to lay sand/soil via dozer. Continued to have sand delivered on-site and stockpiled in several loads. Soil was also spread atop sand at points 135-139, 121-125, 95-100, and 82-86 via dozer.

Summary of CQA Activities

Site visit and observation of construction activities. Approved points 115 and 141 visually. Observed northen portion of large buried concrete pad being excavated. Plan to return in afternoon for approval of additional points. / Afternoon: Visually approved points 49, 61, 74-75, 87-88, and 101.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/27/2017

Cleaning of buried concrete pad. Sand added along parking lot/concrete pad dropoff

Sand piled along approved edge, to the south of concrete storm structure

Drill MW-3 being installed (left) Preparation for the fantail at the stormwater manhole (right)

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/27/2017

Time Arrived: 11:15 / 3:15 Time Left: 11:55 / 3:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 37 °F

Personnel on Site

Owners:	
Contractors:	Ryan Inc., Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	NTH (2), West Michigan Drilling (2)

Summary of Construction Activities

Half of the coal-soil has been removed from the pile sitting on the large concrete pad via one truck - one more truck should stop by this afternoon to remove the rest. Plan to power wash (this afternoon) a strip ~5 feet wide along north portion of buried concrete pad, and lay sand so that there isn't a steep dropoff between the parking lot and the pad. They have began working on the fantail that will be placed at the stormwater manhole (between points 134 and 135) near the outfall. NTH/West Michigan Drilling were present to begin installation of wells. At time of visit they were installing MW-3. Rob had them place it 5 feet east of where fence will be re-installed. The last ~20 feet to the west of the concrete wall/Existing Pond 3 has not been covered with sand or soil although approved. Rob said the wall appears to be sitting on coal and will not be removed until spring, and area has ponded up such that they can't reach it until water is drained. May or may not cover it this fall. / Afternoon Visit: Ryan Inc.had wrapped up for the day, while NTH/West Michigan Drilling were working on drilling the final well (MW-1); wells MW-3 and MW-2 had been installed earlier in the day.

Summary of CQA Activities

Site visit. Observation of construction activities and of installation of wells.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/28/2017

Mid-cleaning of large buried concrete pad

Fantail mid-installation at stormwater manhole (located between points 134 and 135)

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/28/2017

Time Arrived: 11:15 Time Left: 11:55 Page: 1 of 1

Weather: Cloudy, windy Precipitation: None Temp: 55 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other: NTH (2), West Michigan Drilling (2)

Coal-soil has been completely trucked off site from large concrete pad. Have begun the fantail at the stormwater manhole located near the outfall (between points 134 and 135). Plan to place 2" or 4" riprap this afternoon and smooth out sides. Large concrete pad has been cleaned of visible coal and was being power washed. Due to high winds may not finish power washing until tomorrow. Were washing the equipment free of coal in preparation for grading. Plan to work on grading and be finished by end of the week. Fence should be going in next week. All three wells have been installed by West Michigan Drilling under the observation of NTH.

Summary of CQA Activities

Site visit. Observation of construction activities and of wells. E&E was present while drilling soil was checked at Well-3.

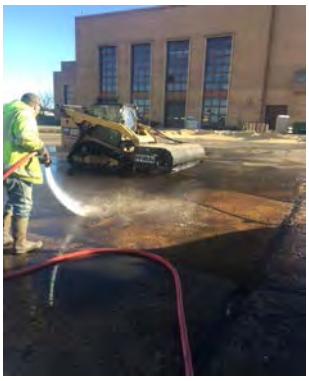
Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/29/2017





Power washing of large buried concrete pad

Well MW-3

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/29/2017

Time Arrived: 10:10 Time Left: 11:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 37 °F

Personnel on Site

Owners:	HBPW, Andrew Reynolds
Contractors:	Ryan Inc., Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Rob and two operators were working on power washing the large concrete pad. Plan to place 4" rip rap on fantail at stormwater manhole, but had not done it yet at time of site visit. Have used both Caterpiller D6 Dozer and Caterpiller Expidator 326 to compact and place all sand on approved areas. Fence was originally to be installed December 6th-8th, however dates have been pushed back to December 11th-13th.

Summary of CQA Activities

Site visit and observation of construction activities. Took four 40-pound samples of sand from various locations evenly distributed throughout the stockpiled sand for the Modified Proctor Test (ASTM D1557) and size distribution. Dropped off two bags of sand to Drisienga & Associates for testing (2 pm) and kept two at the office. Rob gave us the quantity of sand present on site as 13,424 tons (9,258 CY). Only one sample per 5,000 CY was needed for the Modified Proctor Test. Spread out one bag (Sample 3) to dry overnight to be used in determing the grain size distribution.

Notes:

Rob and Andrew discussed how ponds will be left over the winter. Ponds 1 and 2 are both at static groundwater levels. Discussed leaving a pump on site over the winter in case a large stormwater event occurs. Andrew also observed site progress and the new wells.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/30/2017






Power washed large concrete pad

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 11/30/2017

Time Arrived: 12:55 Time Left: 1:15 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 44 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Rob was using the skidsteer to smooth out sand in several locations. Two operators were not present at time of visit. Finished power washing concrete pad in the morning prior to visit. Plan to take tomorrow (Friday 12-1) off and possibly Monday (12-4). Have finished delivering to Zeeland landfill for the year and will get quantities for us. Zeeland landfill has been smoothed out.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/7/2017

Time Arrived: 11:50 Time Left: 4:15 Page: 1 of 1

Weather: Cloudy Precipitation: Snow Temp: 27 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell, Mitch Stark
Other:

Summary of CQA Activities

Confirmed elevations of cleaned points (prior to sand/soil) 41, 67, 93, 120, 249, 250, 4003, 4061, 4071, 4147, 4163, 4166, and 4167 with GPS. Took final elevations with GPS for 41-42, 54-56, 67-70, 81-89, 93-102, 107-115, and 120-127. Determined soil depth at these points, excluding 87-89, 100-102, 113-115, 125-127 (elev. only). Mitch ran field density tests at 18 different points as three tests per acre were required. Surveyed points as D1-D18 in job HBPW Soil.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/8/2017

Time Arrived: 2:35 Time Left: 5:32 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 31 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of CQA Activities

Determined soil depth at points 87-89, 100-102, 113-115, 125-127 (elevations taken yesterday). Took elevation and recorded soil depth for points 116, 128-130, 133-145, 148, 4109, 4110, and 150-160. Points 90 and 146 are covered by the soil stockpile edge. Point 49 is on the edge of the sand stockpile. Surveyed elevation of sand at points 61-63 and 74-77.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/11/2017

Finished fantail with silt fence

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/11/2017

Time Arrived: 10:45 Time Left: 4:20 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 31 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors: Michigan Fence Co. Inc., 2 workers
CQA: E&E Solutions, Amy Mandrell, Mitch Stark
Other:

Michigan Fence Co. Inc. was there for roughly an hour to discuss where the fence would be going in with Rob and 1 operator.

Summary of CQA Activities

Used GPS to take elevation at points (by line) 164-176, 183-192, 201-210, 218-4129, 233-4132, 249-4144, and 250-4162. Used shovel and tape measure to determine soil depth at these locations as well. Tim said (and Rob confirmed) that the back southeast corner is not to grade - did not take elevation or determine soil depth for approved/cleaned points in this area.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/12/2017

Picture of stockpiled soil to the northeast of point 145 (left) and southeast of point 145 (right)

Pictures of stockpiled soil to the southeast of point 145

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/12/2017

Time Arrived: 10:55 Time Left: 12:25 Page: 1 of 1

Weather: Cloudy Precipitation: Snow Temp: 18 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors: Michigan Fence Co. Inc., 2 workers
CQA: E&E Solutions, Amy Mandrell
Other:

Michigan Fence Co. Inc. was just beginning work on new fence, starting in SE corner of site. Plan to work until 4:30 pm today and to be done with fence the earliest by Thursday, Friday at the latest.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Rob does not plan to cover northern points in coal yard area (49, 61-63, 74-77) with topsoil this year - plan to keep this area open for access of construction vehicles to stockpiled sand and topsoil. Remaining points in cleaned coal yard area (146-147, 161-162, 177-180, 194-199, 211-216, 228-232, 245-248) are covered with topsoil, however not set to grade - an extra few feet of soil are in this area for pushing into Pond 3 once dewatered and cleaned/approved in the spring.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/13/2017

Fence posts along south and west end of property

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/13/2017

Time Arrived: 10:45 Time Left: 1:45 Page: 1 of 1

Weather: Cloudy Precipitation: Snow Temp: 19 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., 1 operator
Contractors: Michigan Fence Co. Inc., 2 workers
CQA: E&E Solutions, Amy Mandrell
Other:

Fence posts are in along south side of property and half-way up the west side of the property. Plan to have two more workers out there tomorrow to try and get fence finished by Friday.

Summary of CQA Activities

Site visit and observation of construction activities. Surveyed sand and soil stockpiles (SANDSP1-SANDSP41 and SOILSP1-SOILSP89).

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/14/2017

Time Arrived: 9:30 Time Left: 12:35 Page: 1 of 1

Weather: Cloudy Precipitation: Snow Temp: 14 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors: Michigan Fence Co. Inc., 4 workers
CQA: E&E Solutions, Amy Mandrell
Other:

Working on fence along south and west end. All posts are in, were beginning to add mesh.

Summary of CQA Activities

Site visit and observation of construction activities. Confirmed clean elevations for points 41-4007.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/15/2017

New fence along south and west sides of the property

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/15/2017

Time Arrived: 10:55 Time Left: 12:35 Page: 1 of 1

Weather: Cloudy Precipitation: Snow Temp: 27 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors: Michigan Fence Co. Inc., 4 workers
CQA: E&E Solutions, Amy Mandrell
Other:

South end of fence is finished. Were working on west end of fence (posts are in, adding mesh and gates). Originally planned to be done today but Rob said they will finish up Monday.

Summary of CQA Activities

Site visit and observation of construction activities. Surveyed additional sand stockpiles and fence.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/18/2017

Time Arrived: 8:40 Time Left: 0:00 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 37 °F

Personnel on Site

Owners:
Contractors:
Contractors: Michigan Fence Co. Inc., 4 workers
CQA: E&E Solutions, Amy Mandrell
Other:

Michigan Fence Co. was working on finishing up fence - all posts are in and all mesh is up.

Summary of CQA Activities

Site visit and observation of construction activities. Confirmed clean elevations for points 4008-4167.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/20/2017




Fence is finished. Pictures are the northern portion of the west fence and of the gates


Pictures of the site from the northwest corner of the large concrete pad

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 12/20/2017

Time Arrived: 2:15 Time Left: 3:00 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 34 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Fence was finished on Monday 12/18/17 after site visit. Took some pictures of fence to document.

Summary of CQA Activities

Surveyed location of Well-1 through Well-3 using the Leica GPS. Took three measurements per well (Top of well protective casing, bottom of well/concrete pad, topsoil).

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 1/8/2018

Time Arrived: 1:45 Time Left: 4:15 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 34 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell, Mitch Stark
Other:

Summary of CQA Activities

Surveyed existing well MW-7. Surveyed new wells W-1 to W-3.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 2/26/2018

Time Arrived: 1:00 Time Left: 1:15 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 44 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of CQA Activities

Quick check on site to see how winter snow melt is draining. Site appeared to be draining well with exception of ponding on top of the large buried concrete pad.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 2/28/2018

Time Arrived: 3:00 Time Left: 3:35 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 50 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of CQA Activities

Quick check on site to see how winter snow melt is draining. Site appeared to be draining well with exception of ponding on top of the large buried concrete pad.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 6/1/2018

Overview pictures of the site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 6/4/2018

Time Arrived: 9:00 Time Left: 12:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 64 °F

Personnel on Site

Owners:	HBPW - Andrew Johnson
Contractors:	Ryan Inc. - John Johnson, 1 operator
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Over the weekend Ryan finished placing/grading the sand and topsoil. They also re-placed the styrofoam and backfilled with soil the vaccum holes made to determine the location of the snowmelt lines. At time of visit the operator was working on making the edges of the site look nice using the skidsteer. They were having equipment taken off of the site, and they do not plan to seed until Friday.

Summary of CQA Activities

Site visit and observation of construction activities. Surveyed the eatern disturbed area boundary. Finished up topsoil elevation/depth survey.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

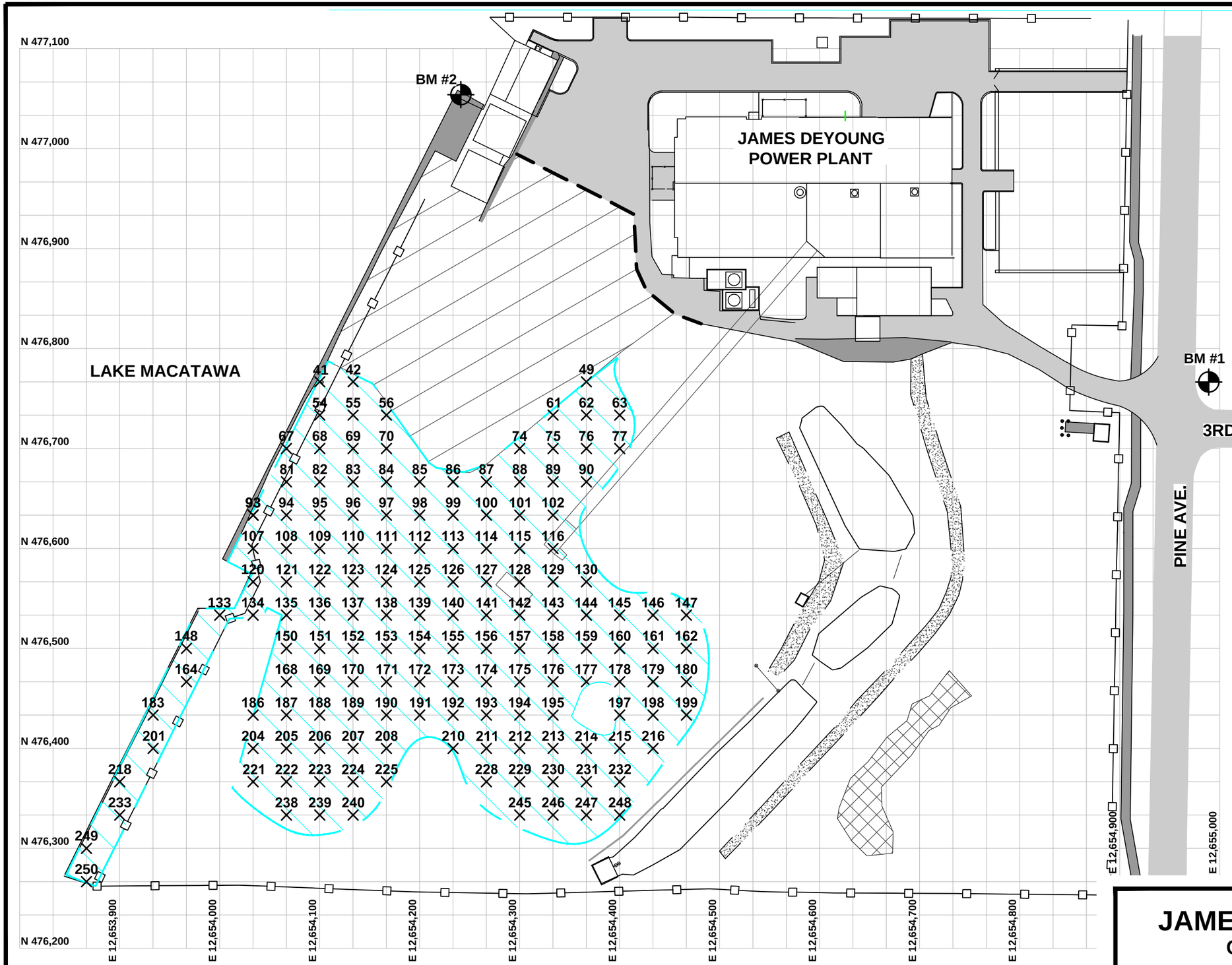
Progress Pictures

Project: James DeYoung Power Plant Coal Yard Closure Project No: 133-17-001 Date: 6/15/2018

Overview pictures of the site after seeding

APPENDIX B.1

COAL REMOVAL DOCUMENTATION



LEGEND

APPROXIMATE LIMITS OF COAL/SOIL MIX

EXISTING FENCE

EXISTING BENCHMARK

AREA OF COAL REMOVAL

EXISTING LANDSCAPING

GRID NODES

COAL YARD 1 ×

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

N

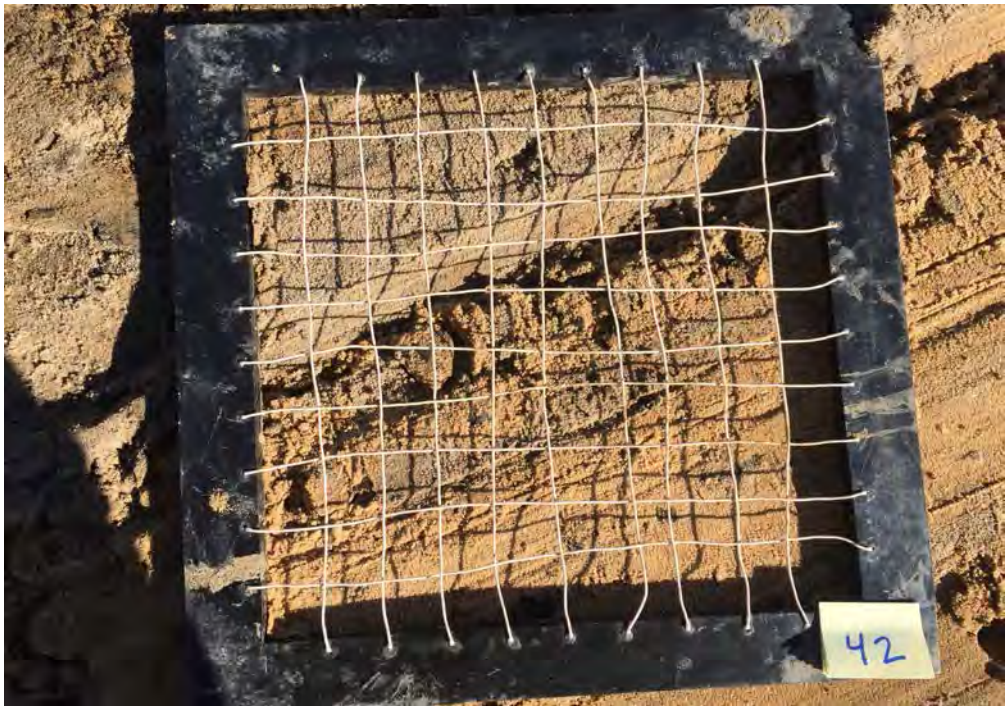
DRAFT

JAMES DEYOUNG POWER PLANT

COAL REMOVAL DOCUMENTATION - GRID NODES

SCALE 1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET		1A	

Brown silty fine sand

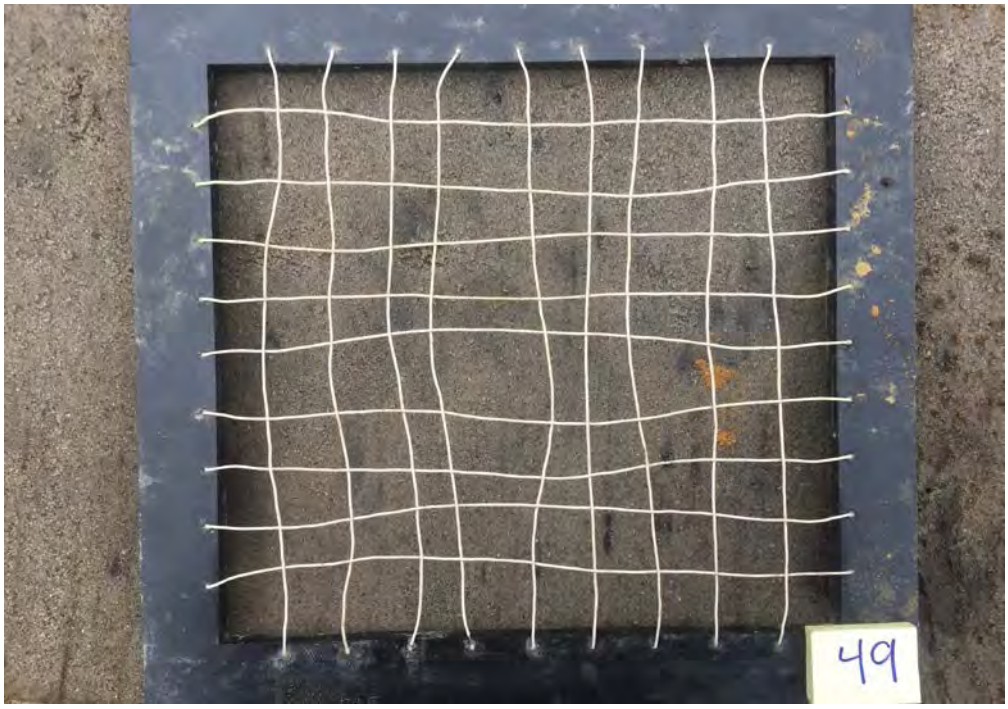


Light brown silty fine sand

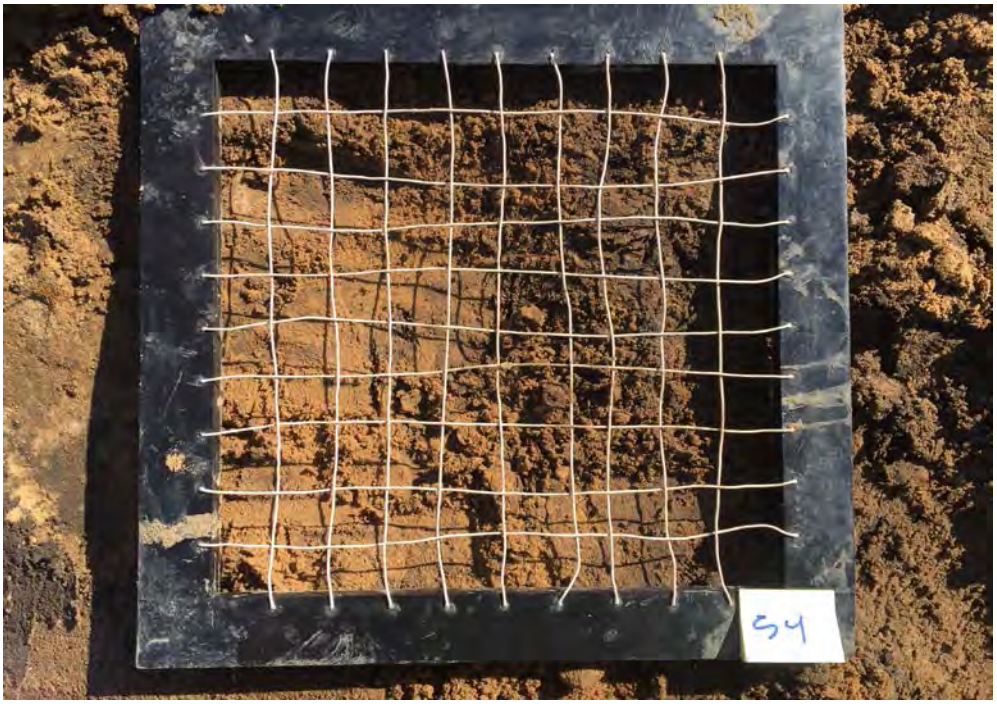
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 49 / 54



Gray silty medium sand



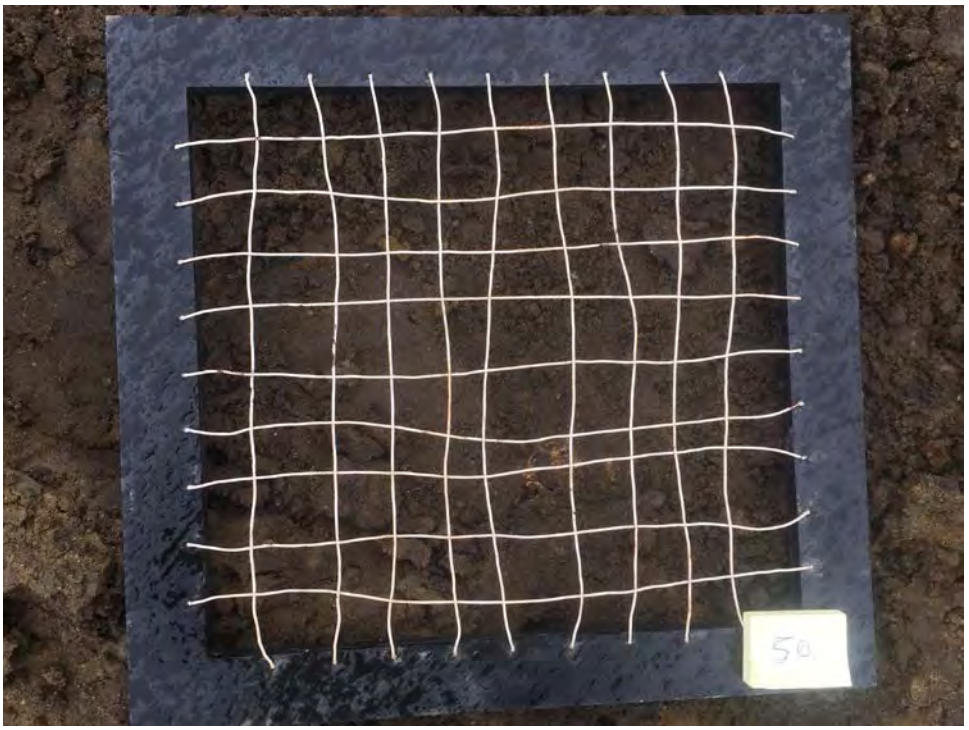
Variegated orange-brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 55
56

Variegated orange-brown silty fine sand with trace gravel

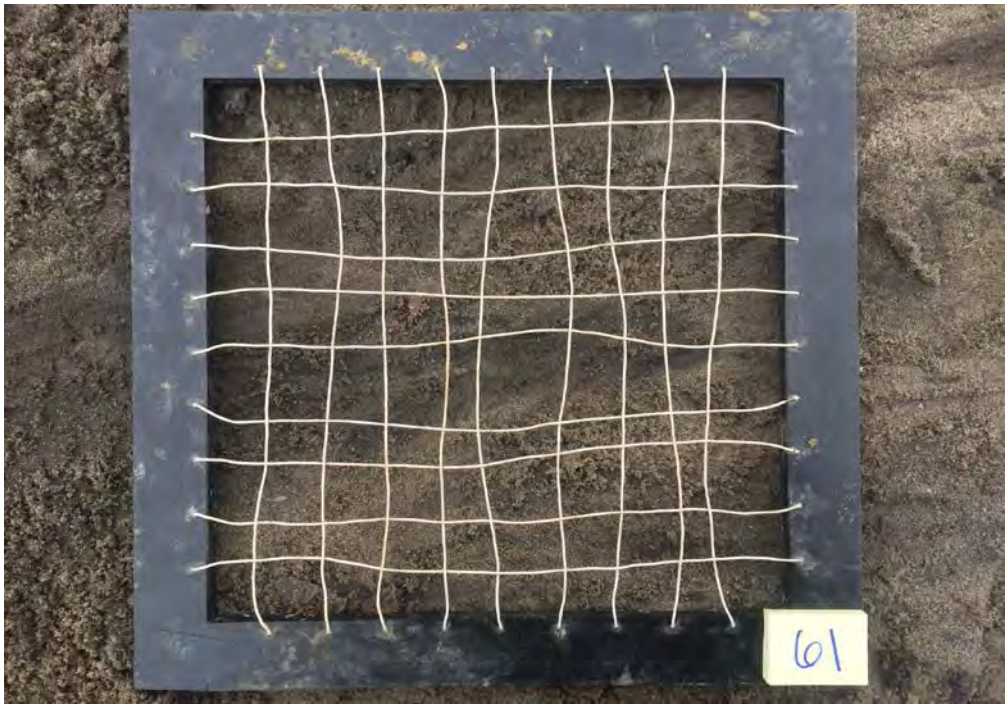


Dark brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 61, 62



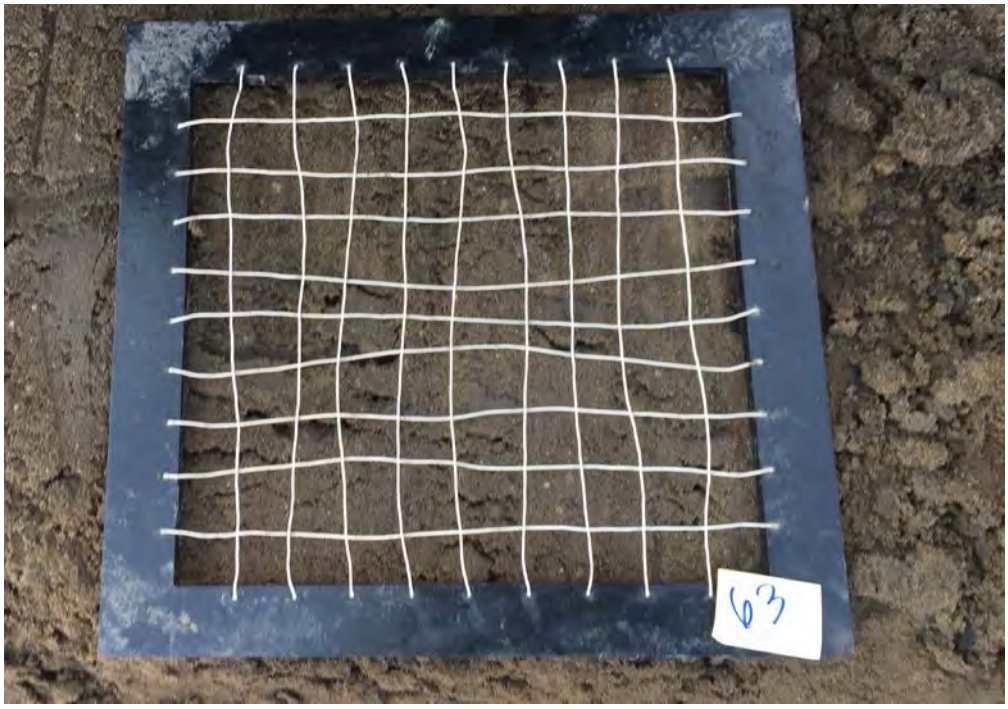
Gray silty fine sand with sticks present

Brown silty fine sand

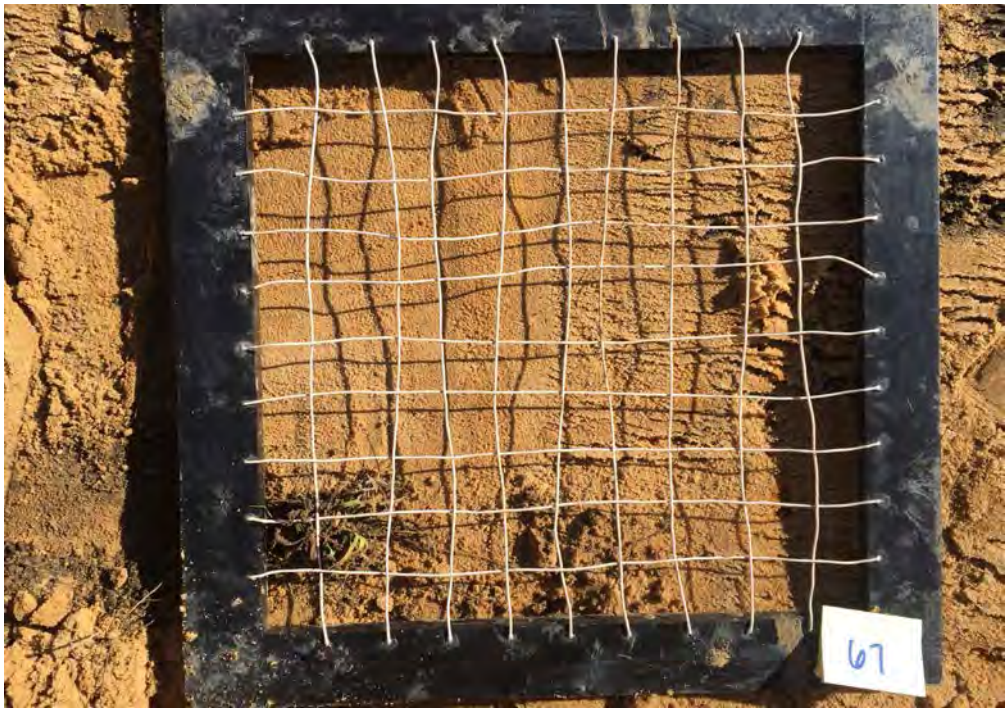
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

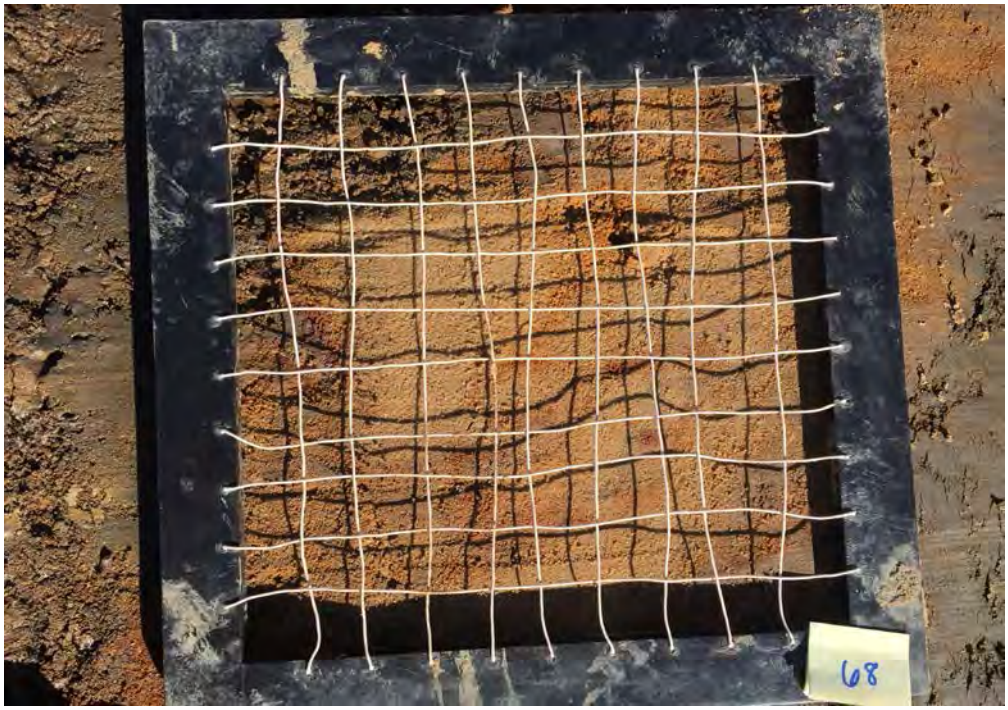
Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 63
67



Gray silty fine sand with trace gravel



Brown silty fine sand with roots



Variegated orange-brown silty fine sand with trace gravel

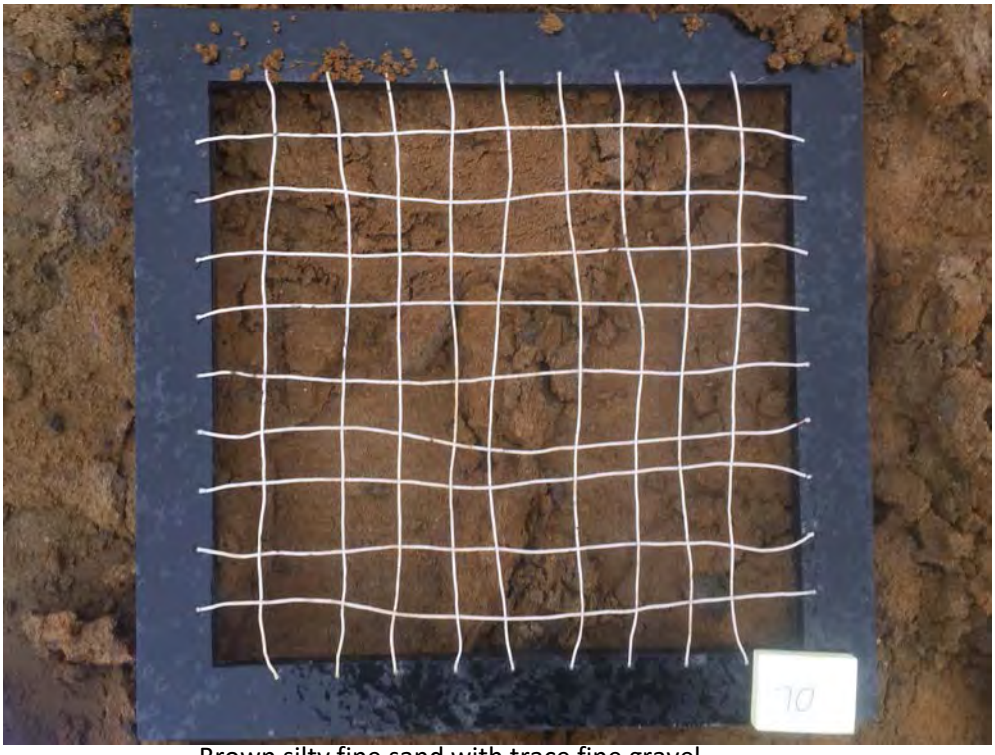
Variegated orange-brown silty fine sand

Engineering & Environmental Solutions, LLC

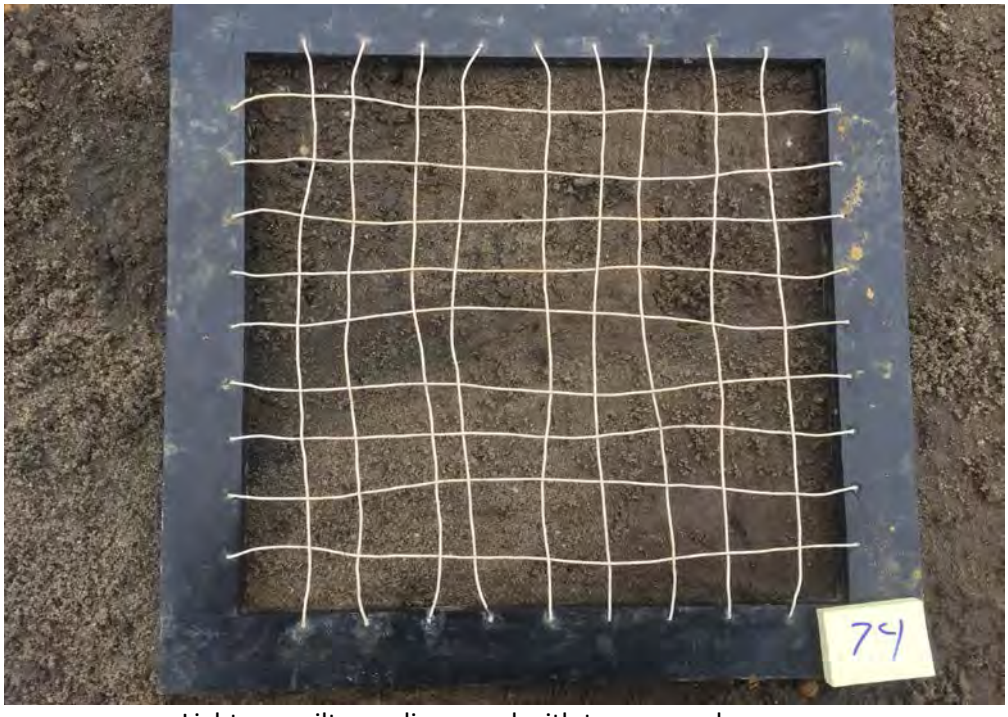
Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 70

74



Brown silty fine sand with trace fine gravel

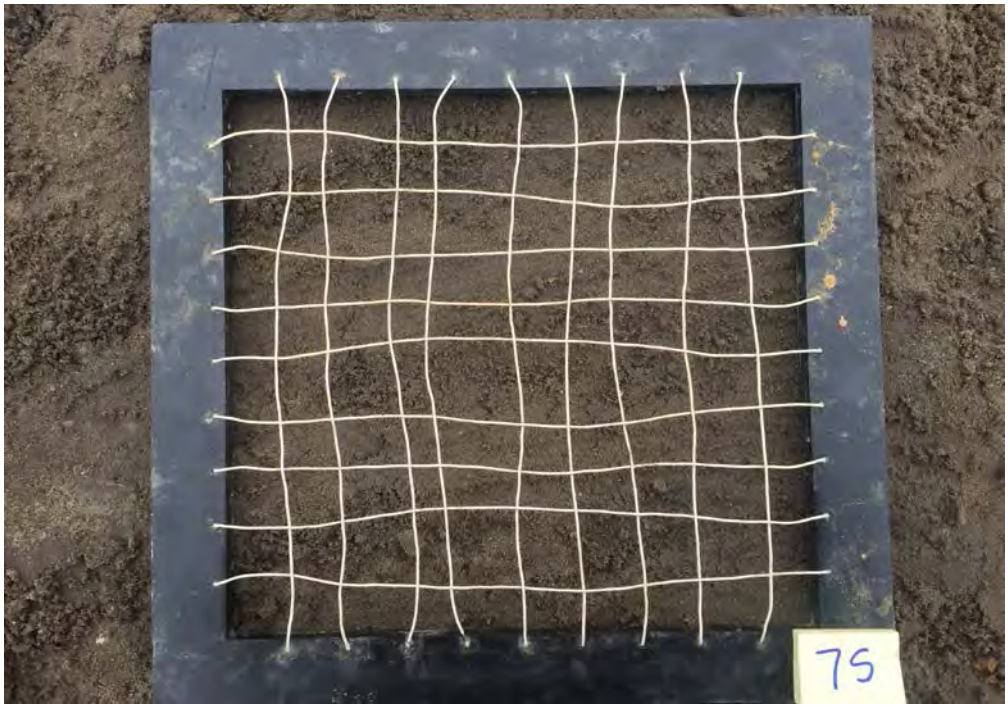


Light gray silty medium sand with trace gravel

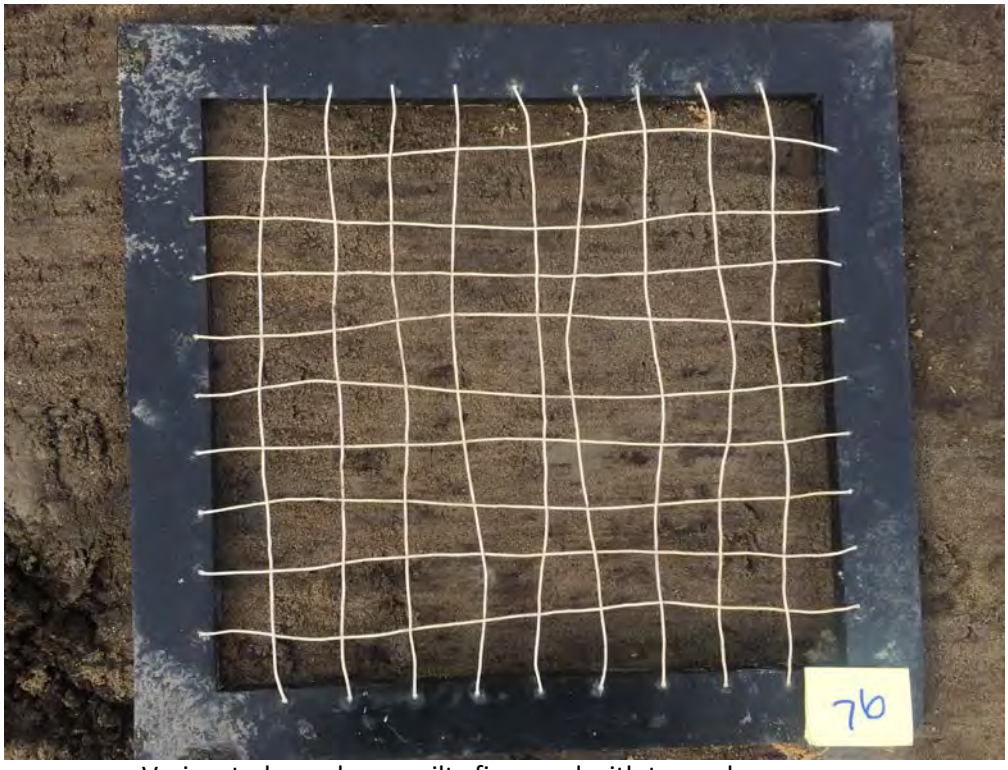
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 75, 76



Dark gray silty medium sand with trace gravel and roots

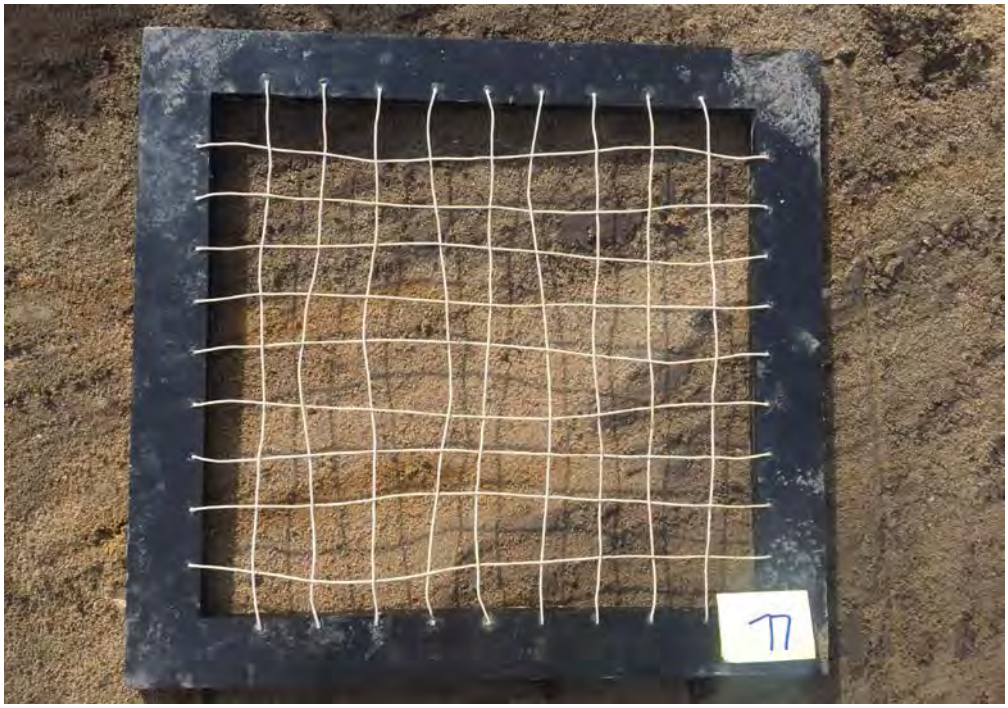


Variegated gray-brown silty fine sand with trace clay

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 77, 81



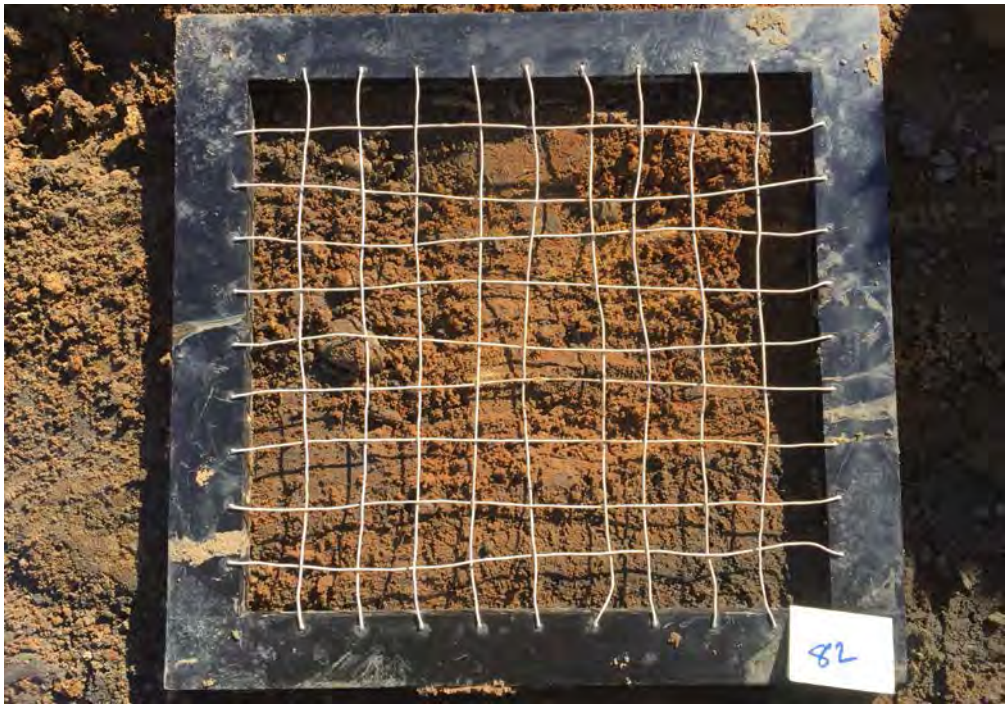
Variegated orange-brown silty fine sand with trace clay

Light brown silty fine sand with trace clay

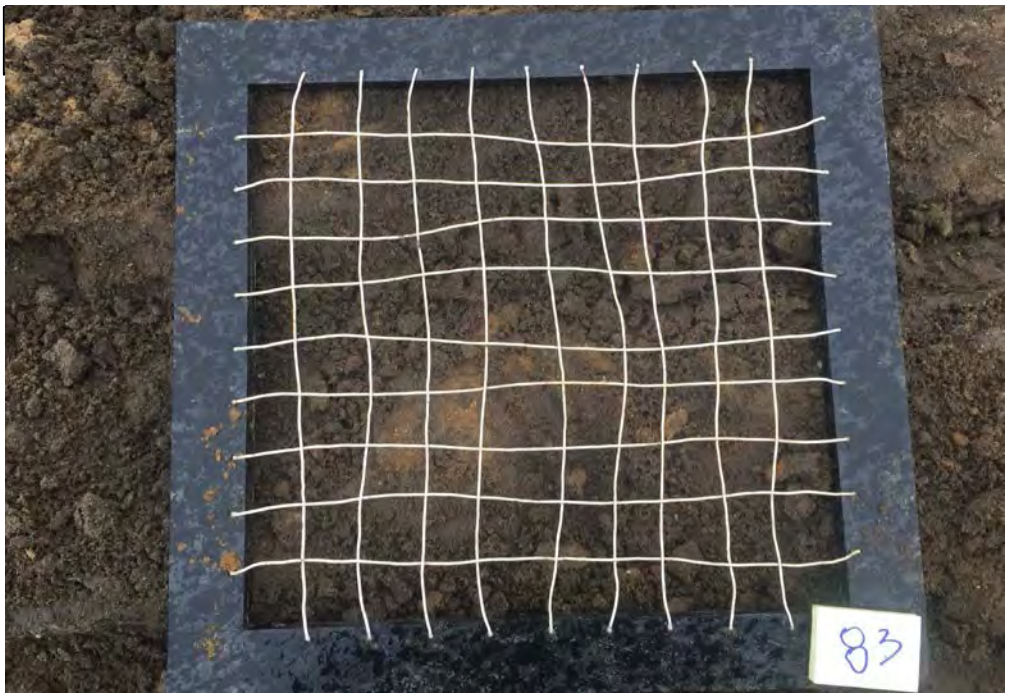
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

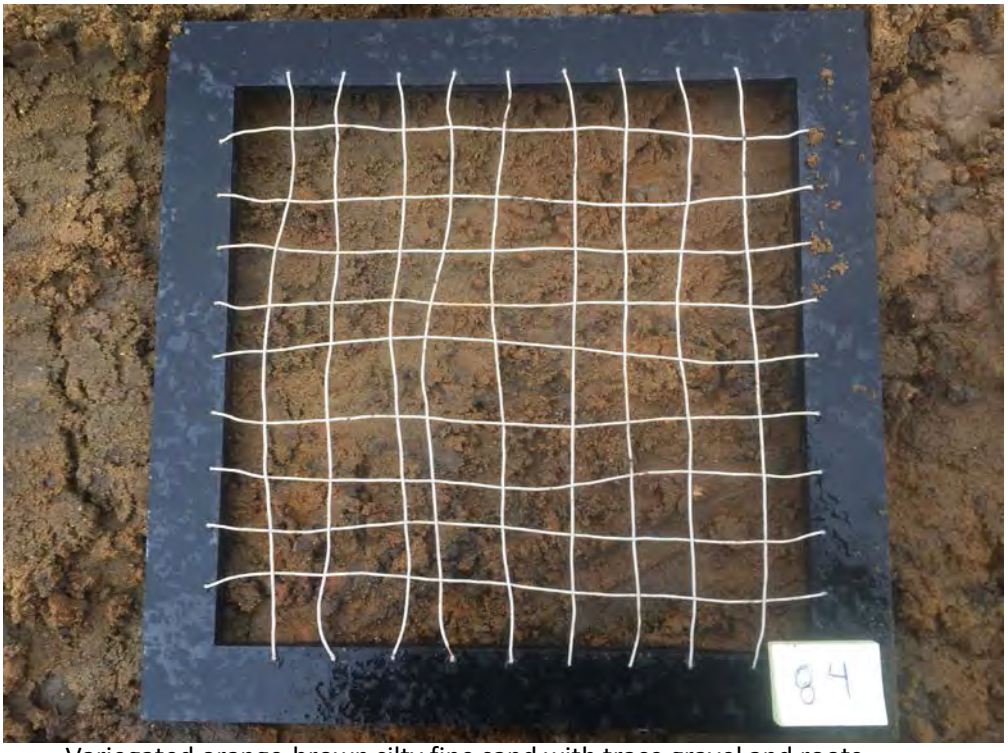
Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 82, 83



Variegated orange-brown silty fine sand with trace gravel



Dark brown silty fine sand with trace gravel



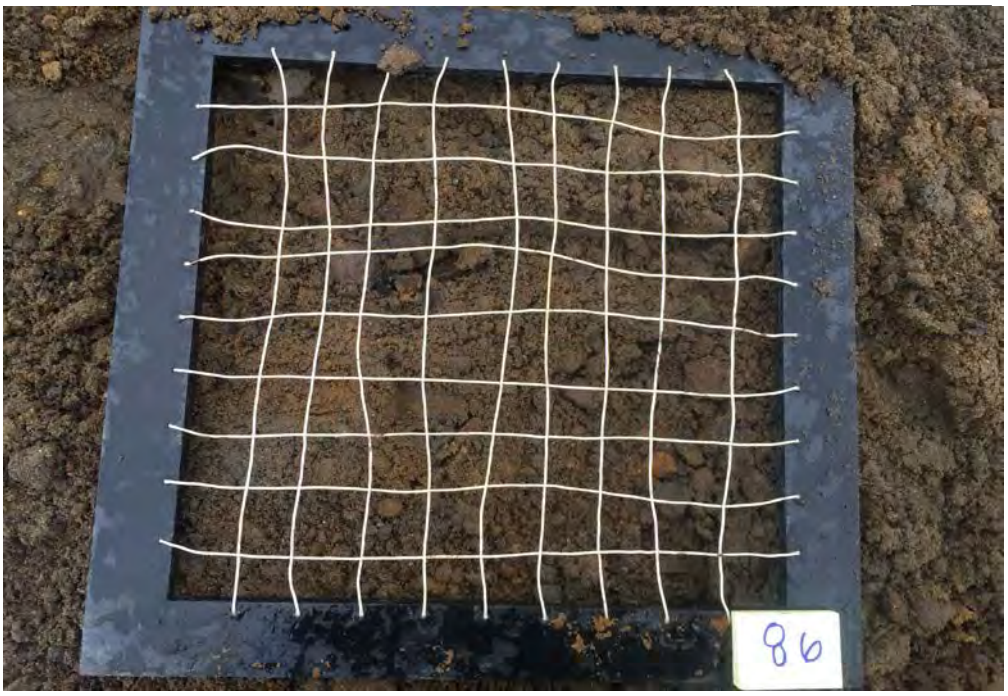
Variegated orange-brown silty fine sand with trace gravel and roots

Variegated orange-brown silty fine sand with trace gravel and roots

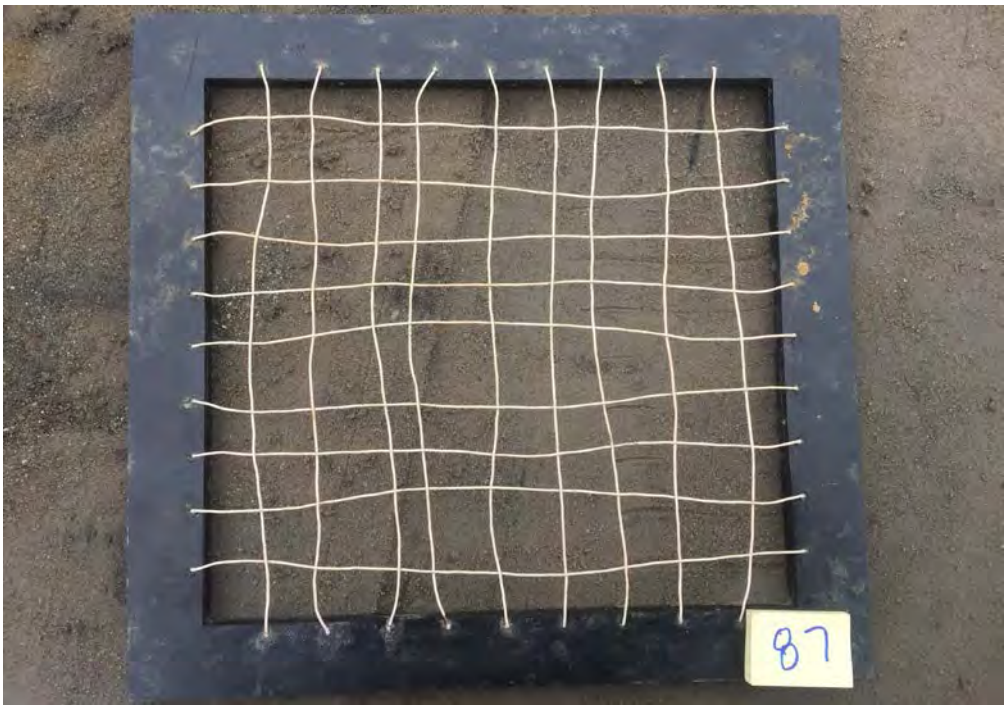
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 86, 87

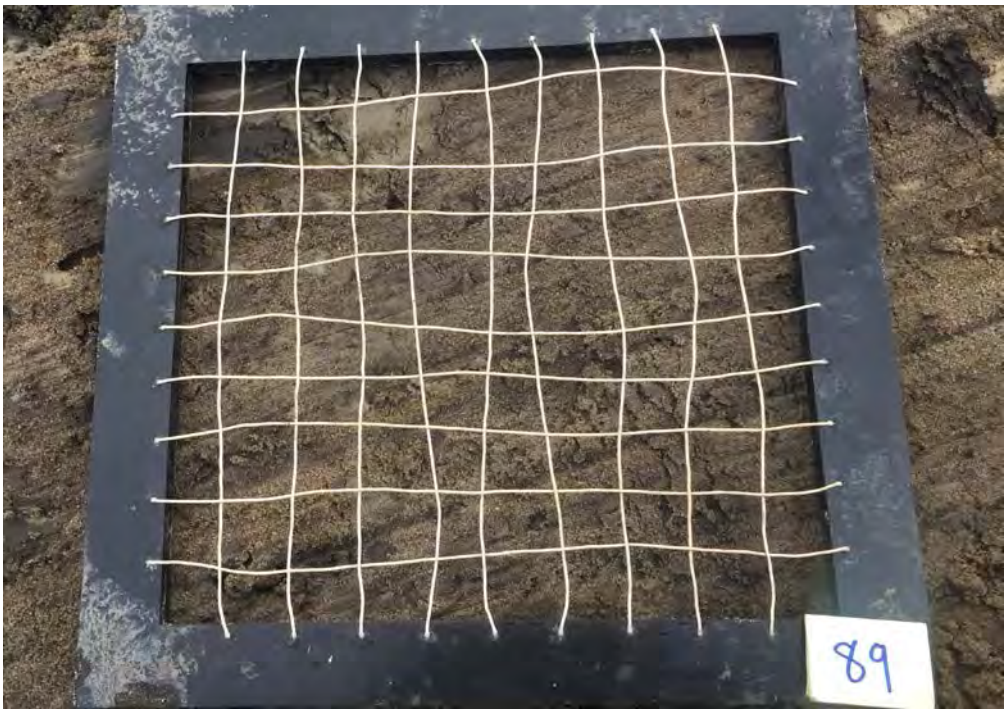


Variegated orange-brown silty fine sand with trace gravel and roots



Gray silty fine sand

Light gray silty fine sand with trace fine gravel



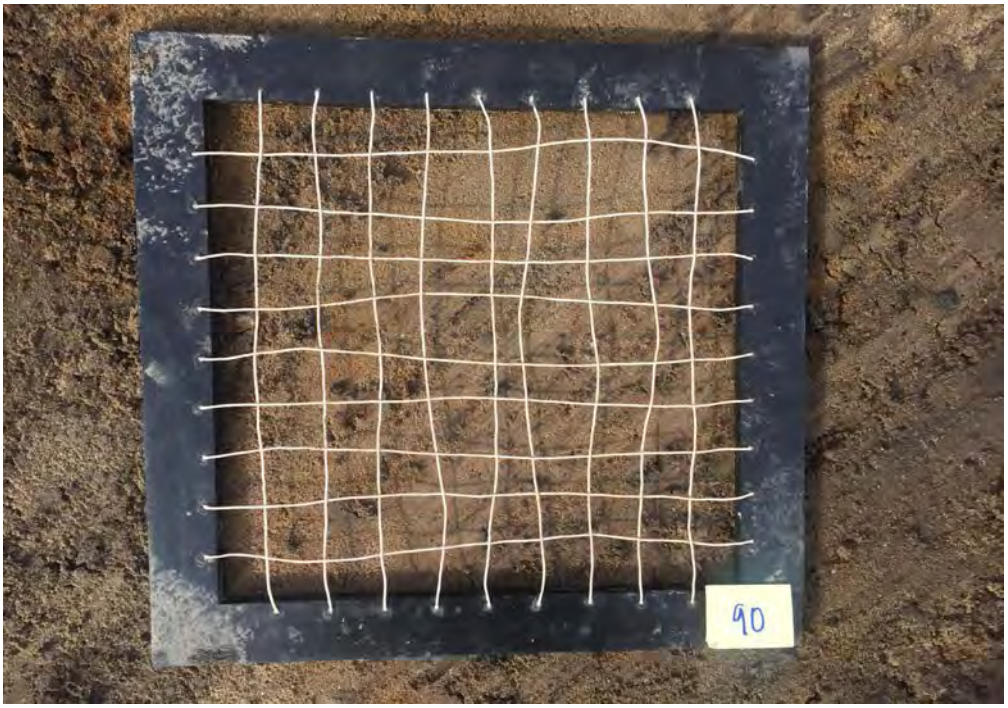
Variegated light-dark gray silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 90

93



Variegated brown-orange silty fine sand with trace gravel

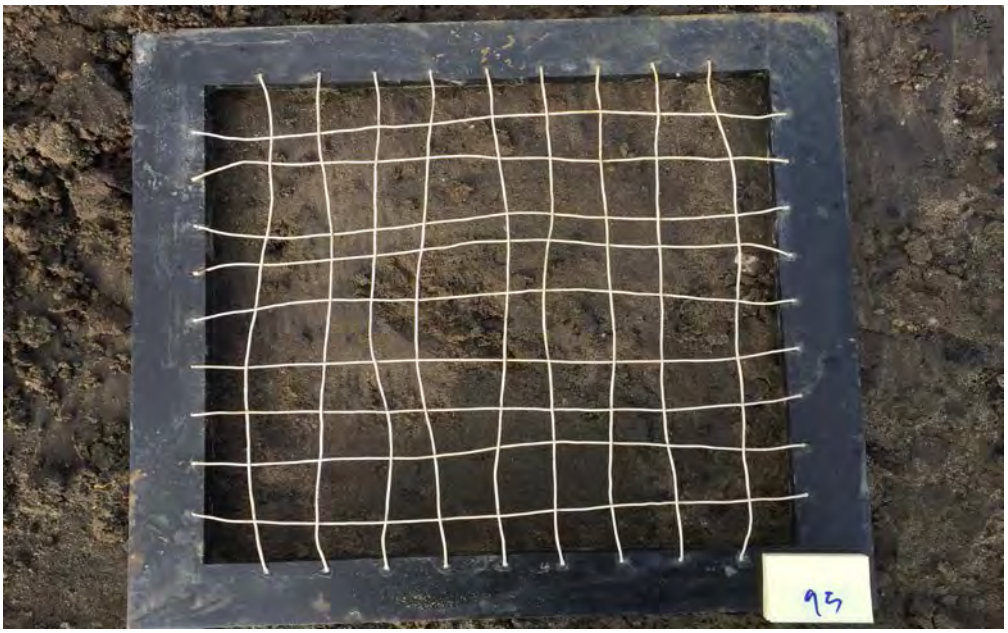
Orange silty fine sand with trace roots

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

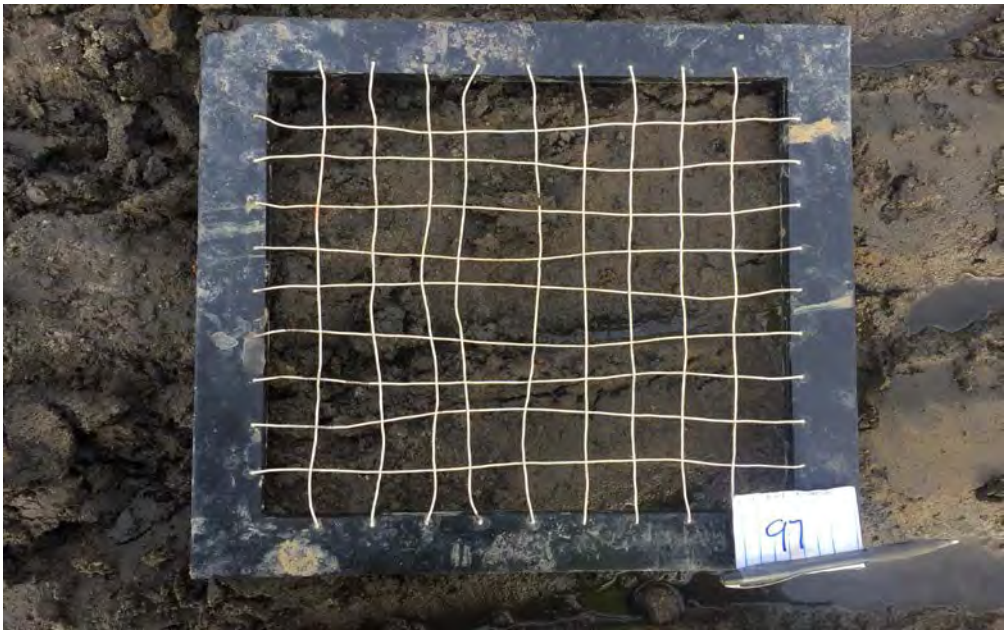
Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 94
95

Orange silty fine sand with trace gravel

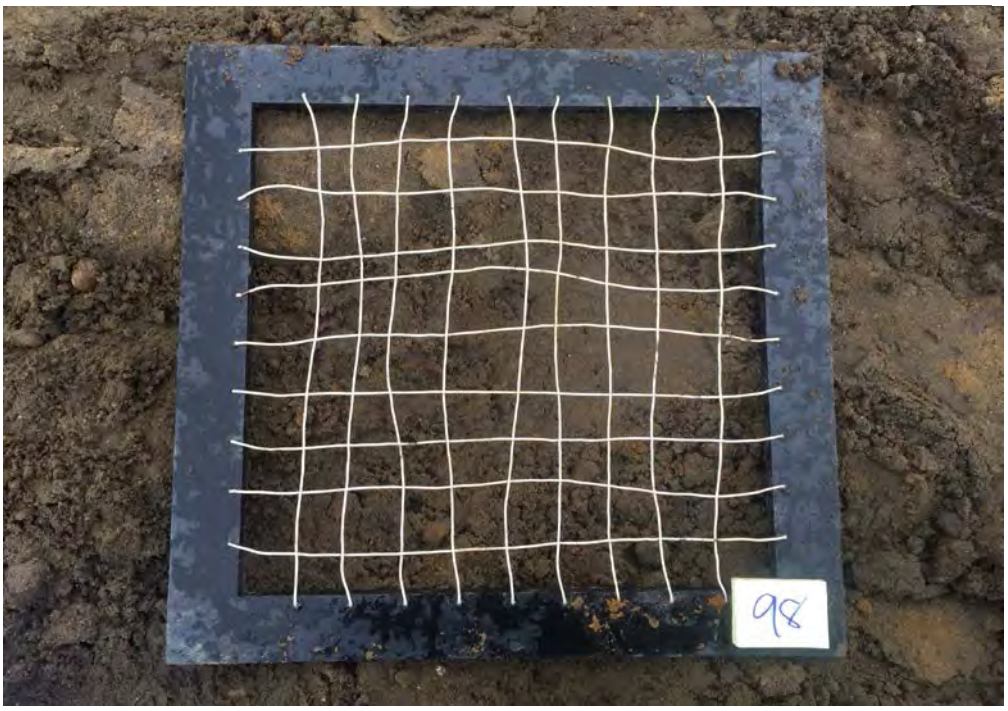


Gray silty fine sand with trace clay

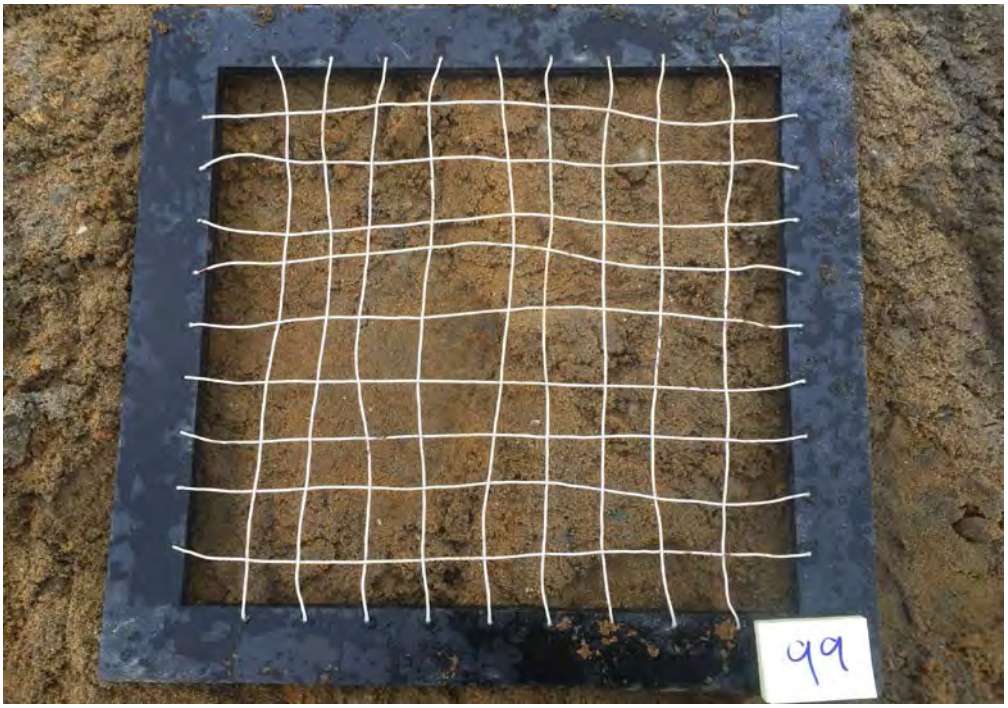
Variegated orange-gray silty fine sand with trace roots



Variegated gray-brown silty fine sand with trace gravel



Variegated orange-brown silty fine sand with trace gravel

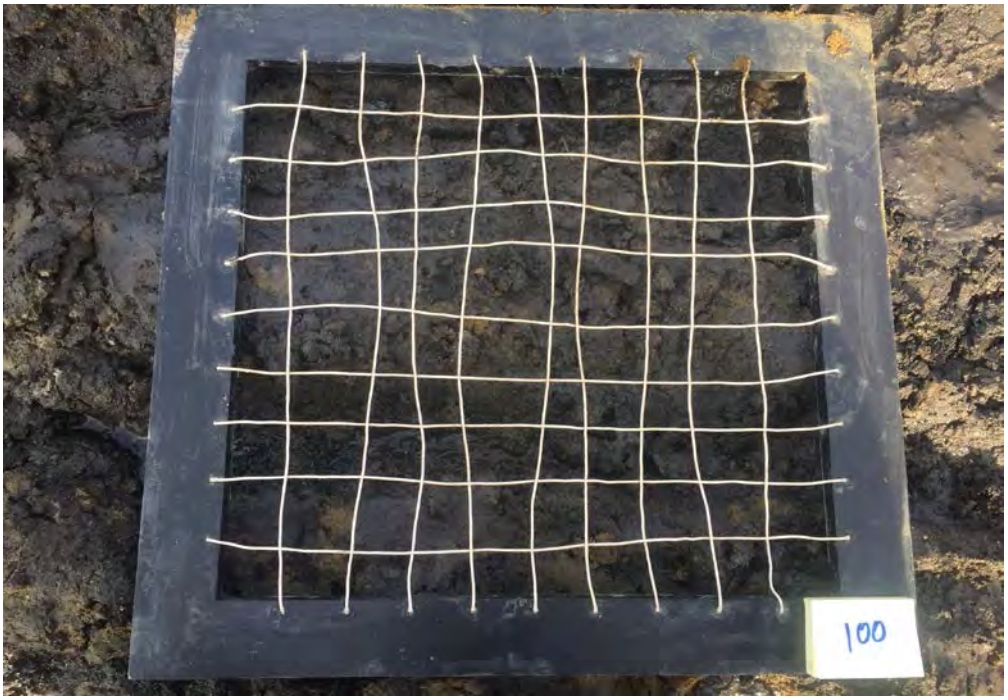


Variegated orange-brown silty fine sand with trace gravel and sticks

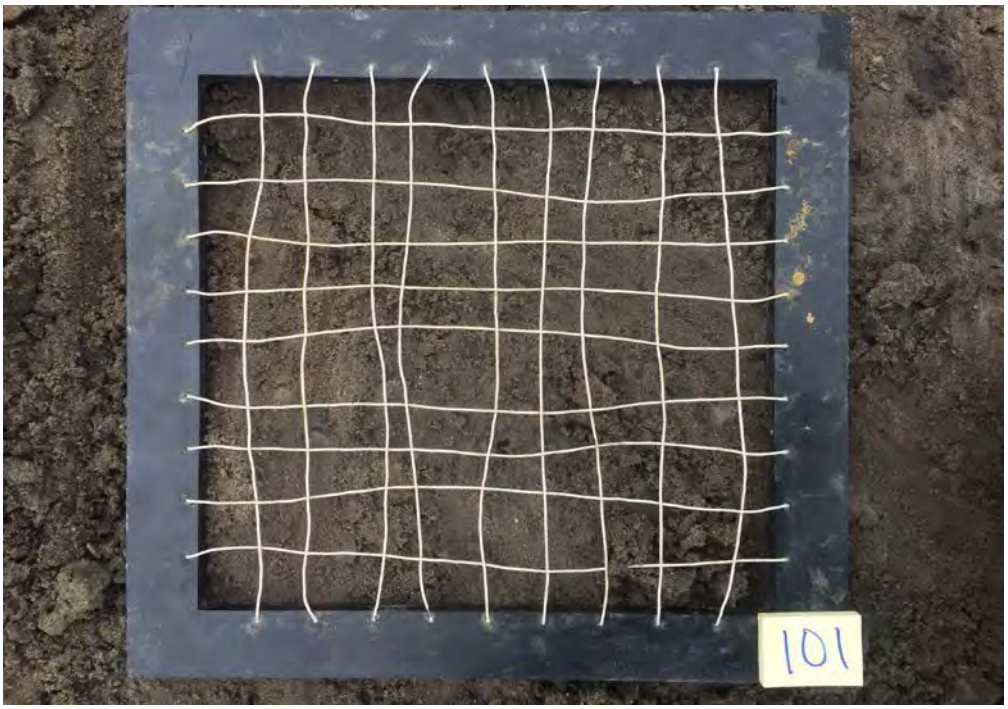
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 100
101



Medium gray silty fine sand with trace gravel and sticks

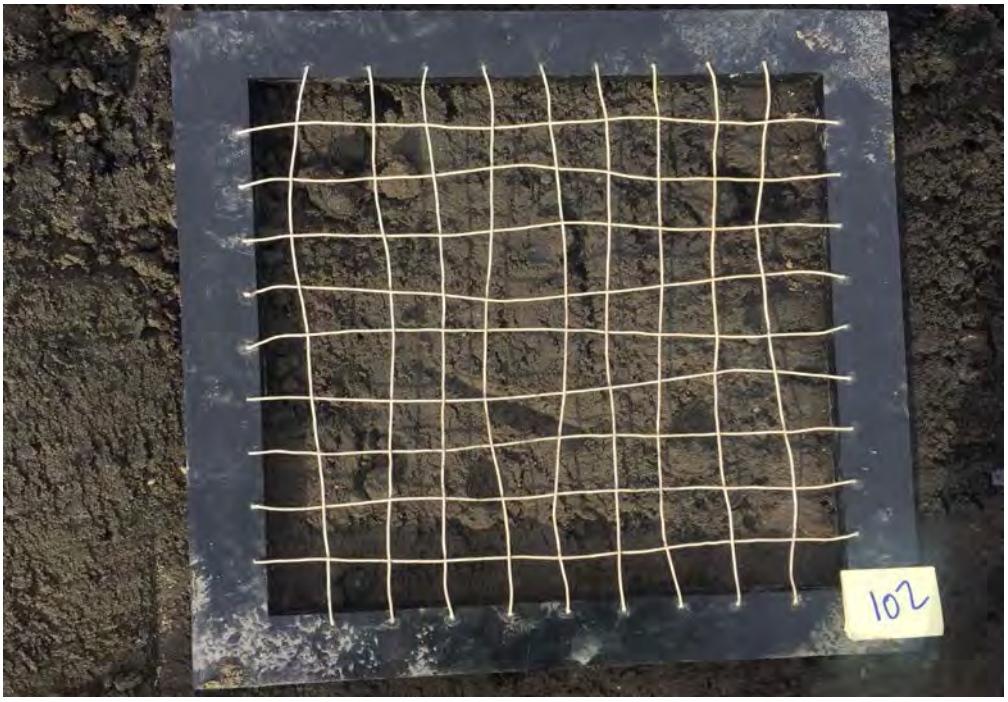


Medium gray silty fine sand with trace gravel and sticks

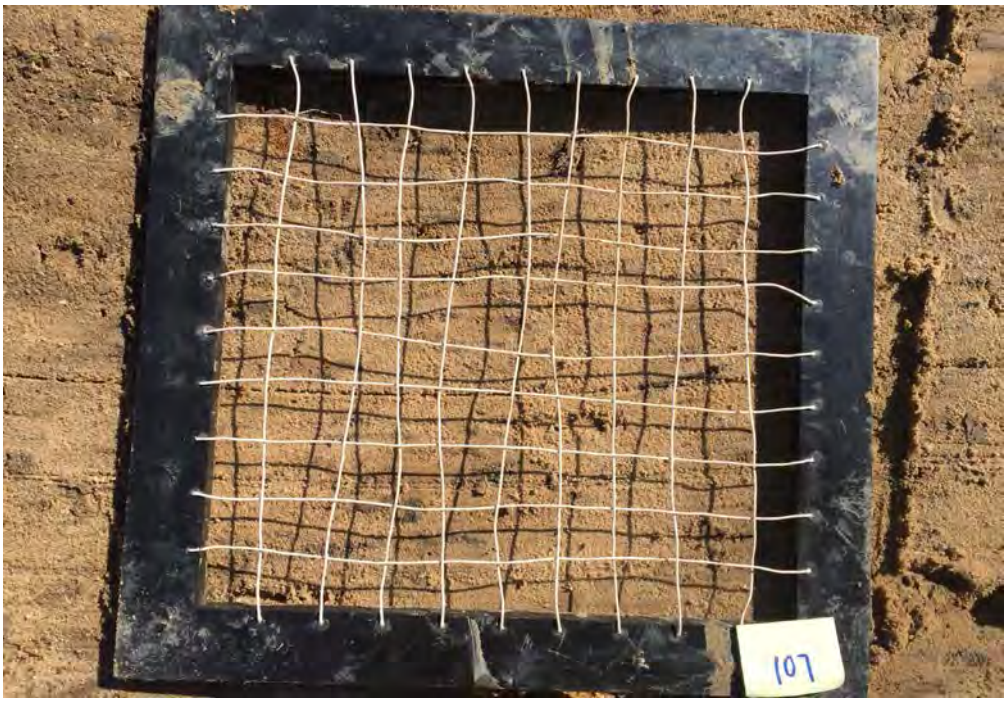
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 102
107

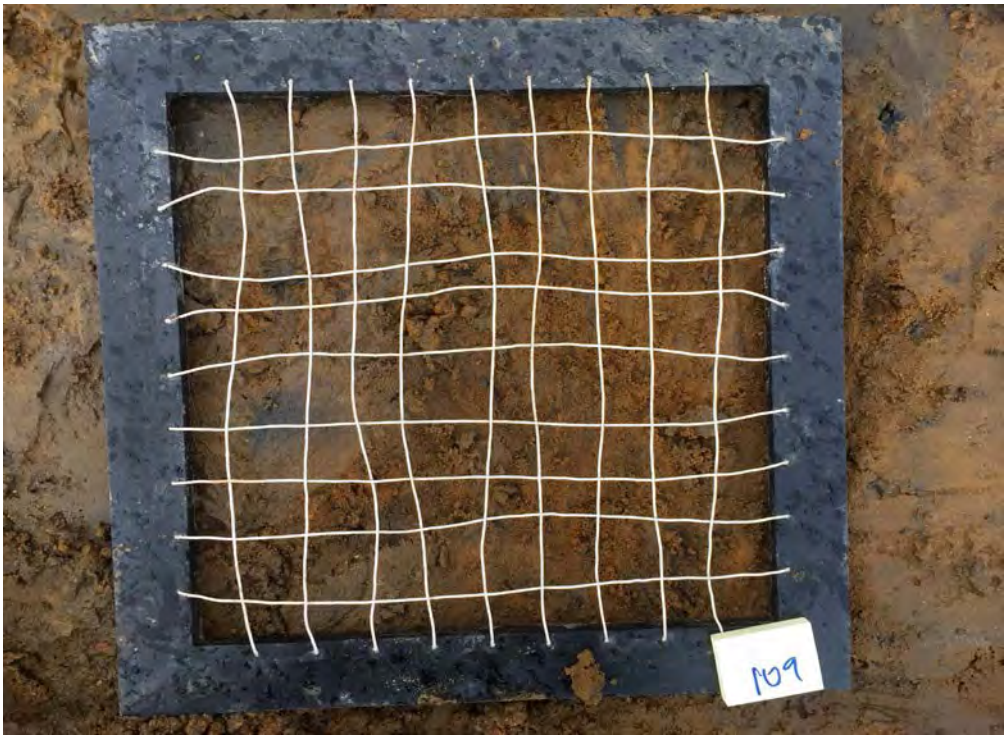


Dark gray silty fine sand with trace gravel and clay



Light brown silty fine sand with trace roots

Variegated dark gray-brown silty sand with trace gravel

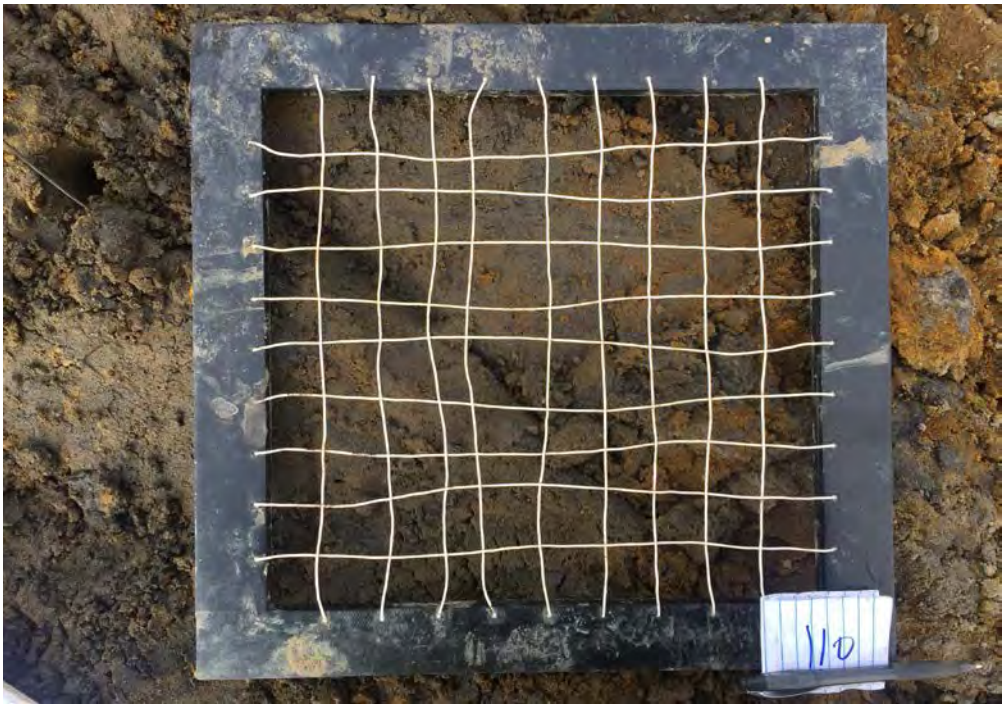


Variegated orange-brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 110, 111



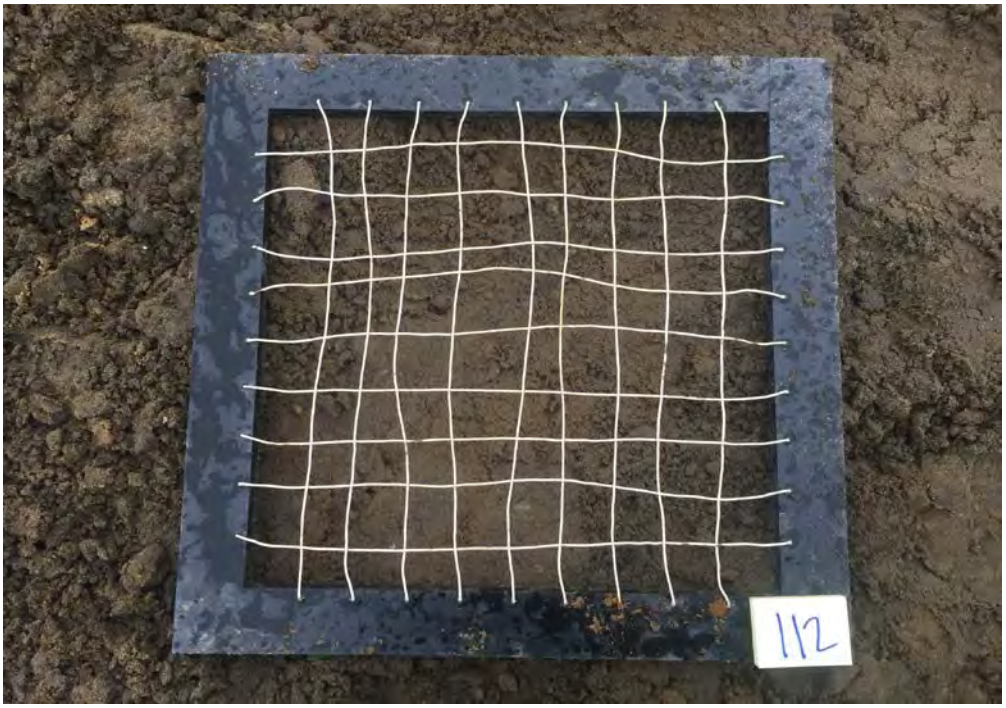
Variegated dark gray-orange silty sand with trace roots

Variegated dark gray-orange silty sand with trace gravel and roots

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 112, 113



Brown silty fine sand with trace gravel

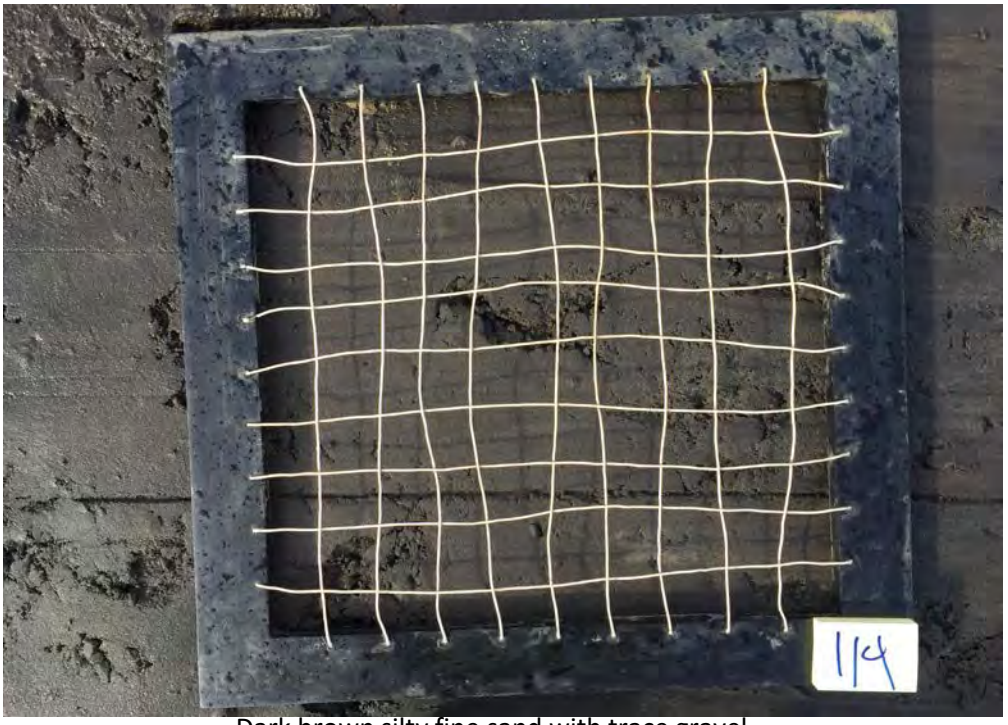
Dark brown silty fine sand with trace gravel and sticks

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 114, 115

Dark brown silty fine sand with trace gravel



Dark brown silty fine sand with trace gravel

Variegated orange-brown silty fine sand with trace large sticks

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 116
120

Light brown silty fine sand with trace gravel

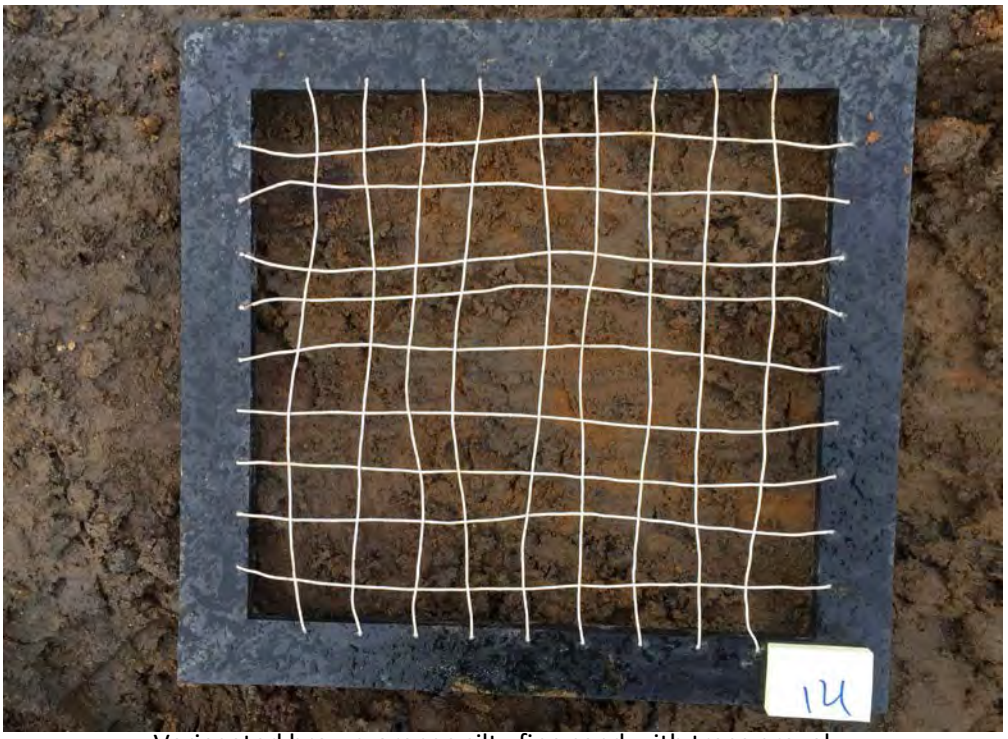
116 omitted due to conveyor building/hopper vault foundations

Light brown silty fine sand with trace gravel

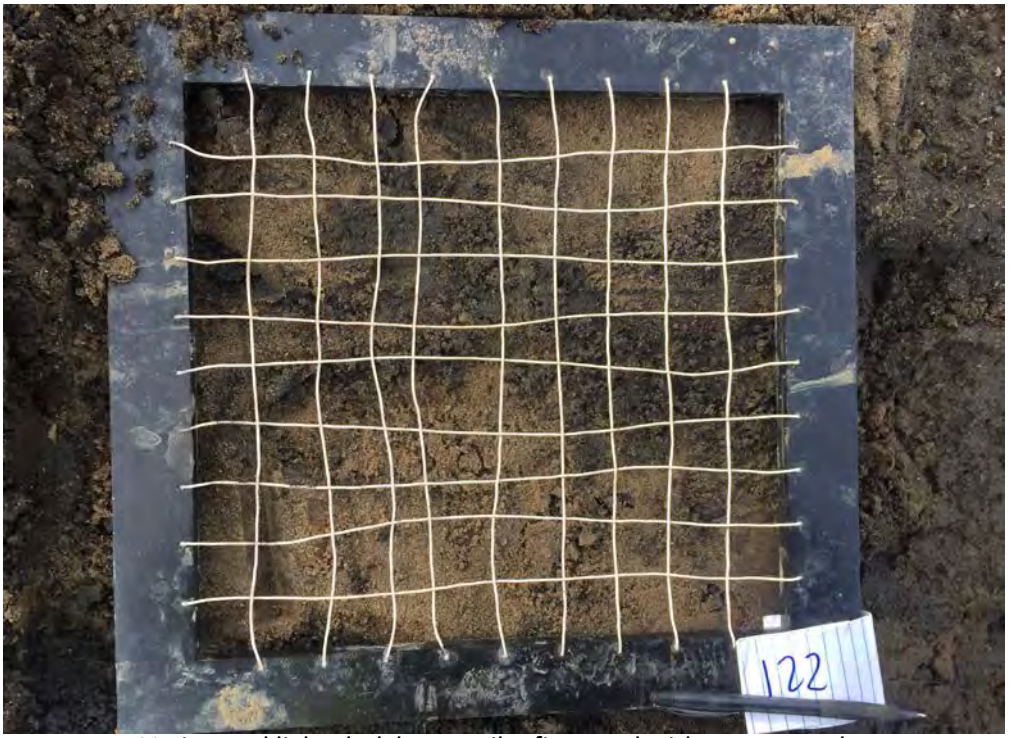
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 121, 122



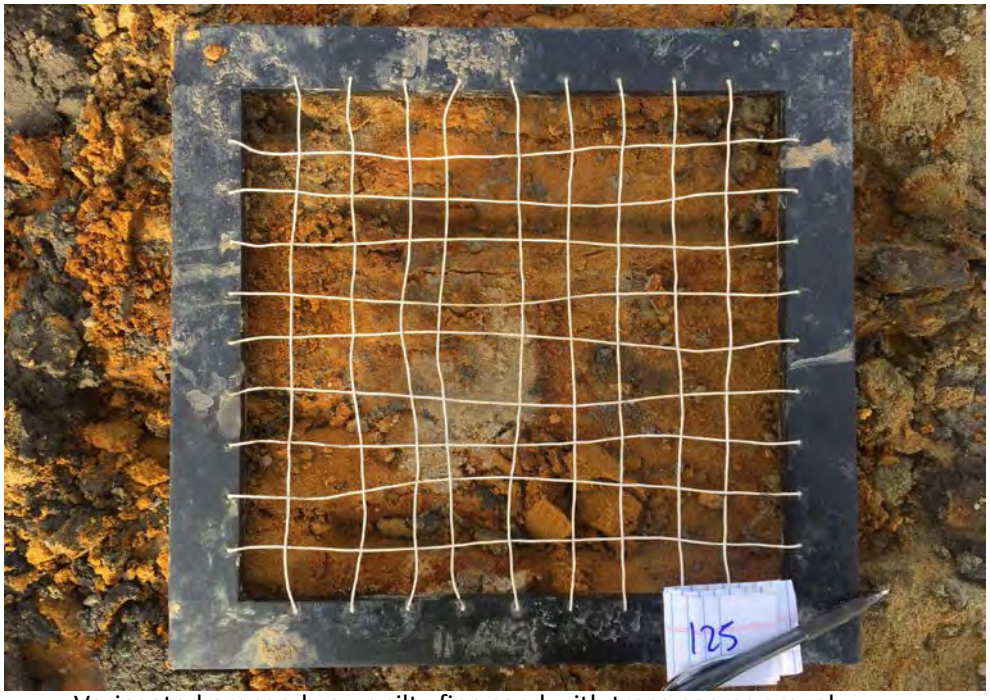
Variegated brown-orange silty fine sand with trace gravel



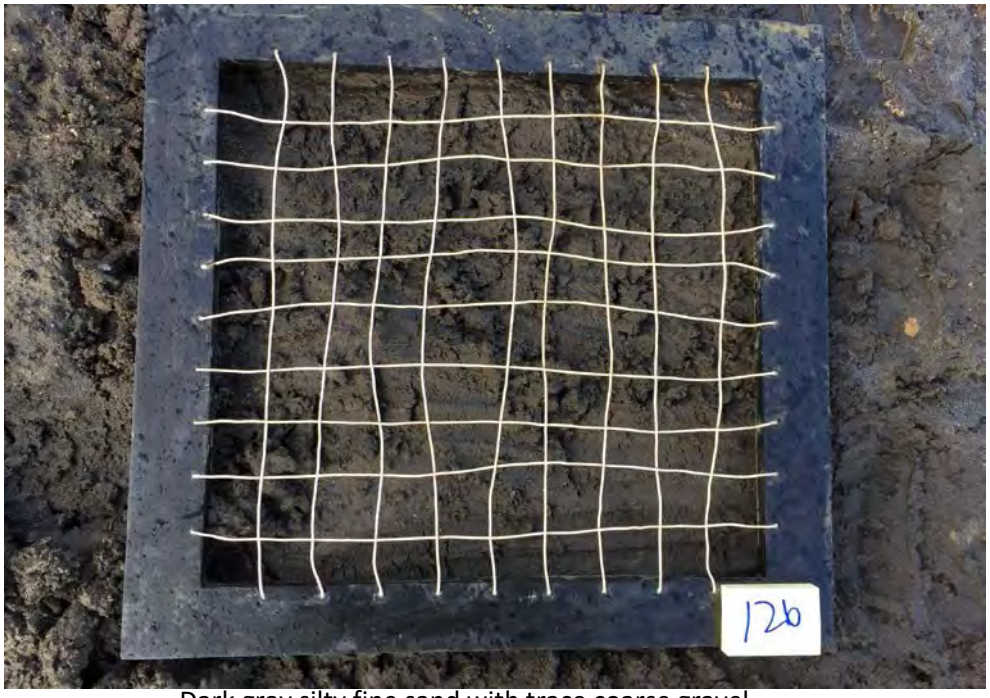
Variegated light-dark brown silty fine sand with trace gravel

Brown silty fine sand with trace gravel

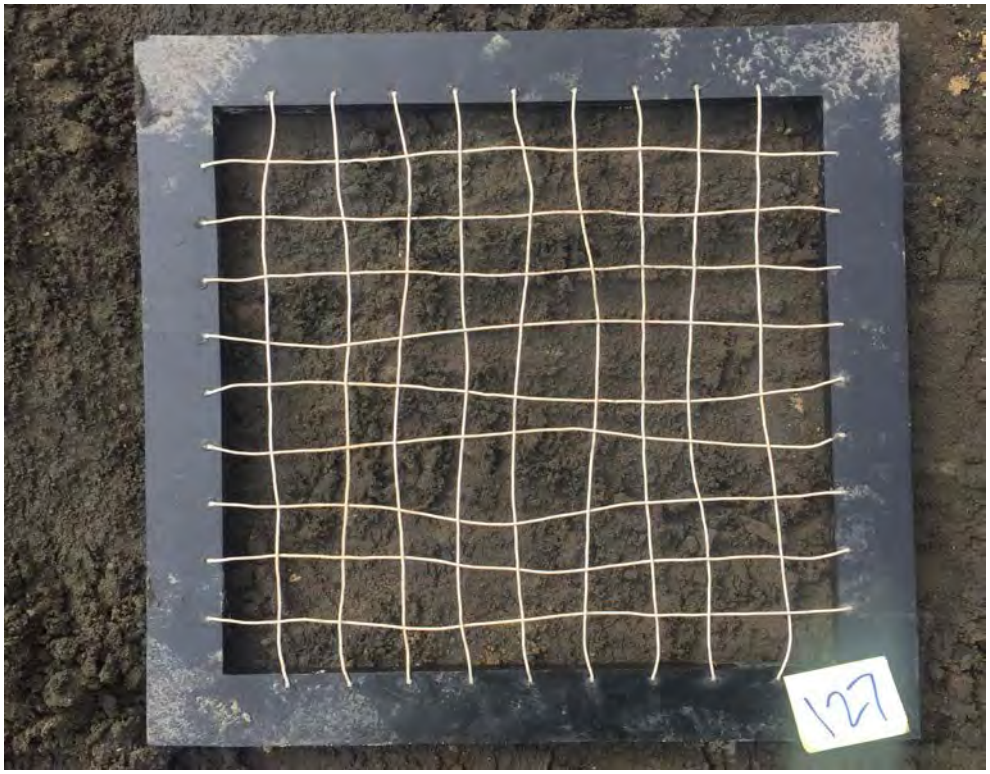
Brown silty fine sand with trace gravel sticks and roots



Variegated orange-brown silty fine sand with trace coarse gravel

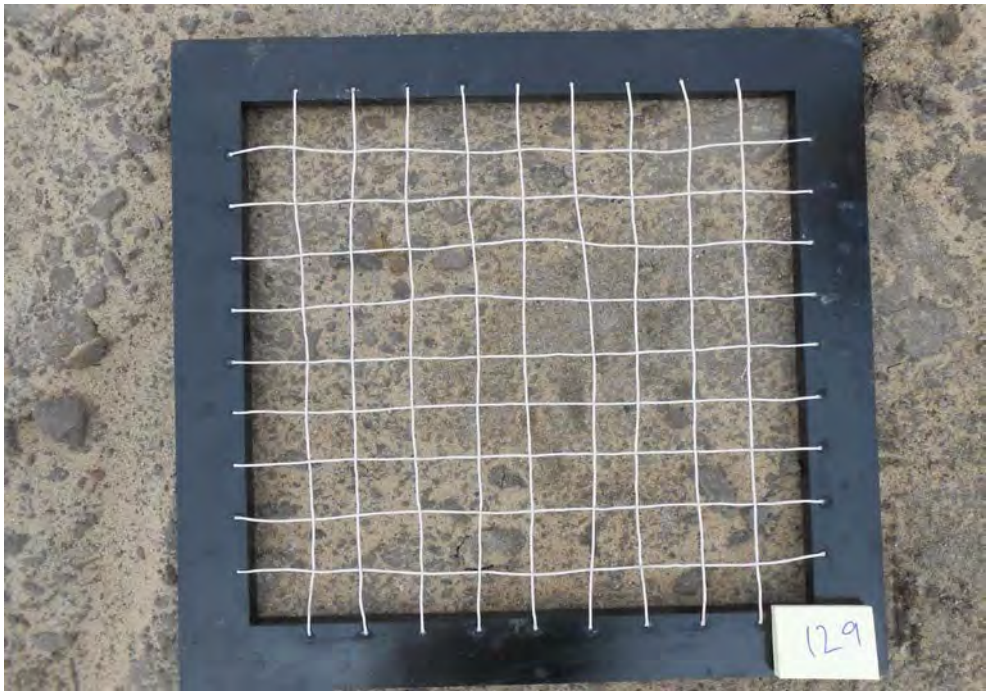


Dark gray silty fine sand with trace coarse gravel



Variegated dark gray-brown silty fine sand

128 omitted due to conveyor building/hopper vault foundations



Light brown silty fine sand with little coarse gravel

Light gray silty fine sand with little coarse gravel

Variegated orange-brown silty fine sand with little coarse gravel and roots and trace clay; some coal chunks (less tha 5%). *Point 4107 was renumbered to 133 during construction due to the location of the point being outside ash boundaries*

Variegated orange-brown silty fine sand with trace coarse gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 135, 136

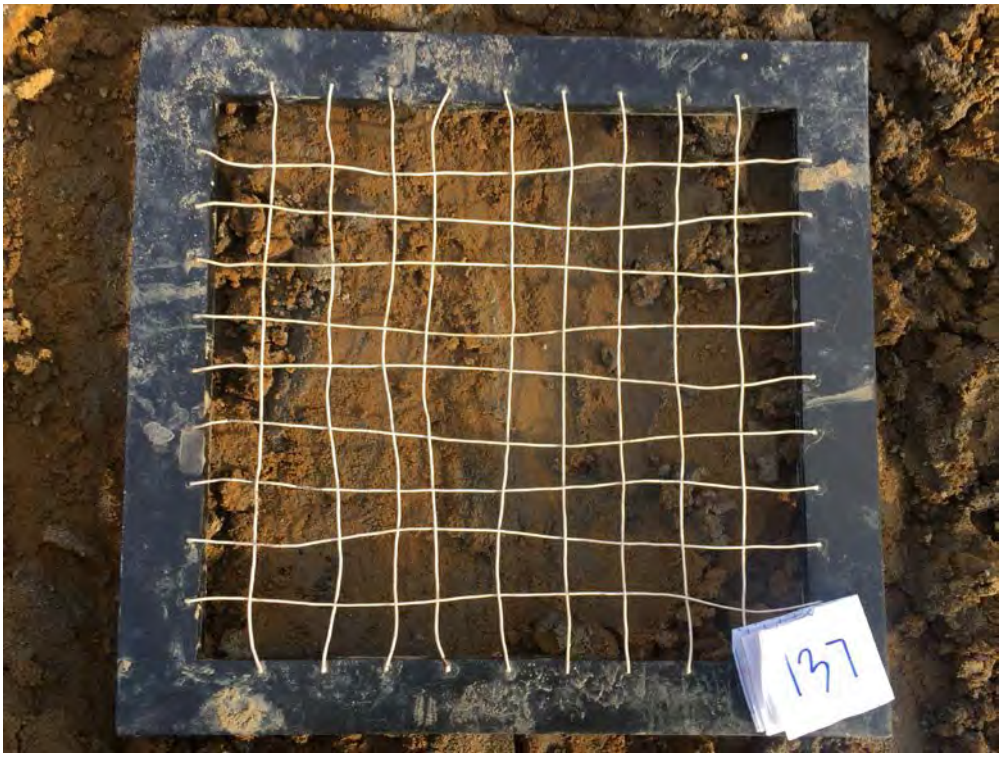
Light brown silty fine sand with trace gravel and roots

Variegated orange-brown silty medium sand with some gravel and sticks

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 137
138



Orange silty fine sand with trace roots

Brown silty fine sand with trace gravel

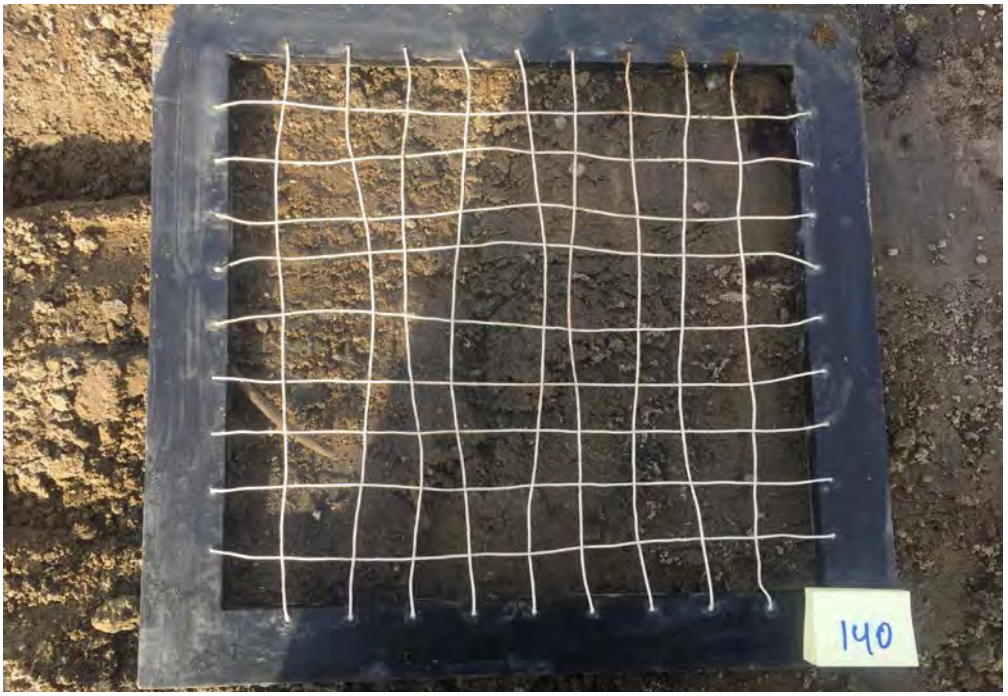
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 139, 140

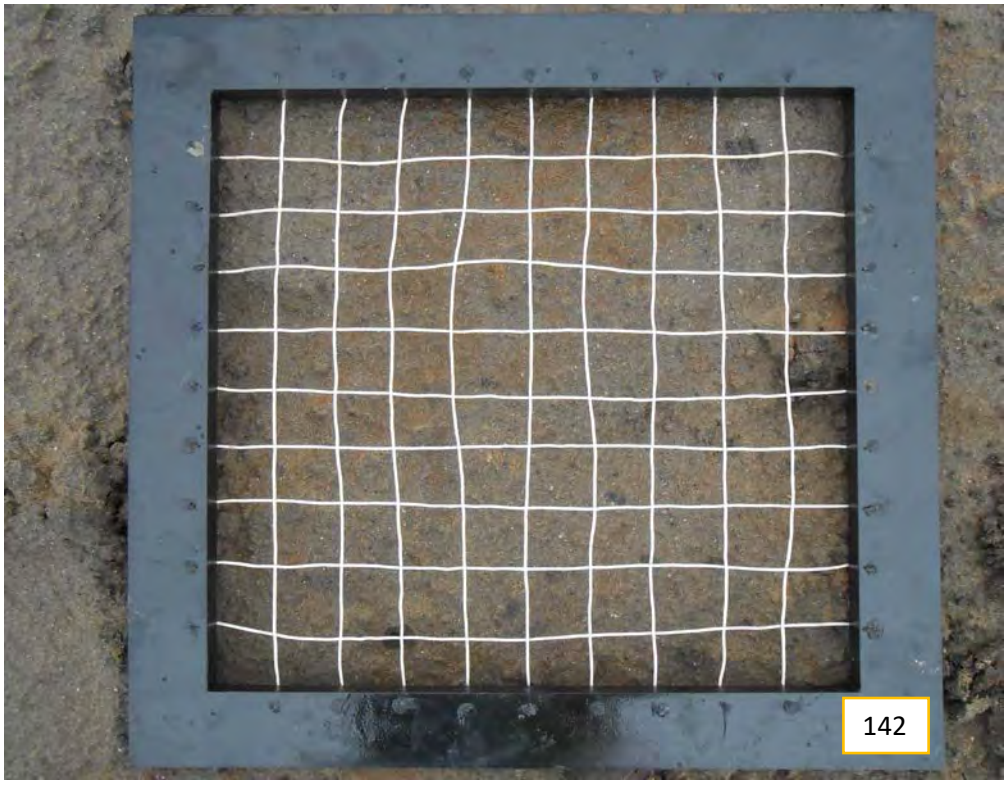
Brown silty fine sand with trace gravel and sticks

Variegated brown-orange silty fine sand with trace coarse gravel



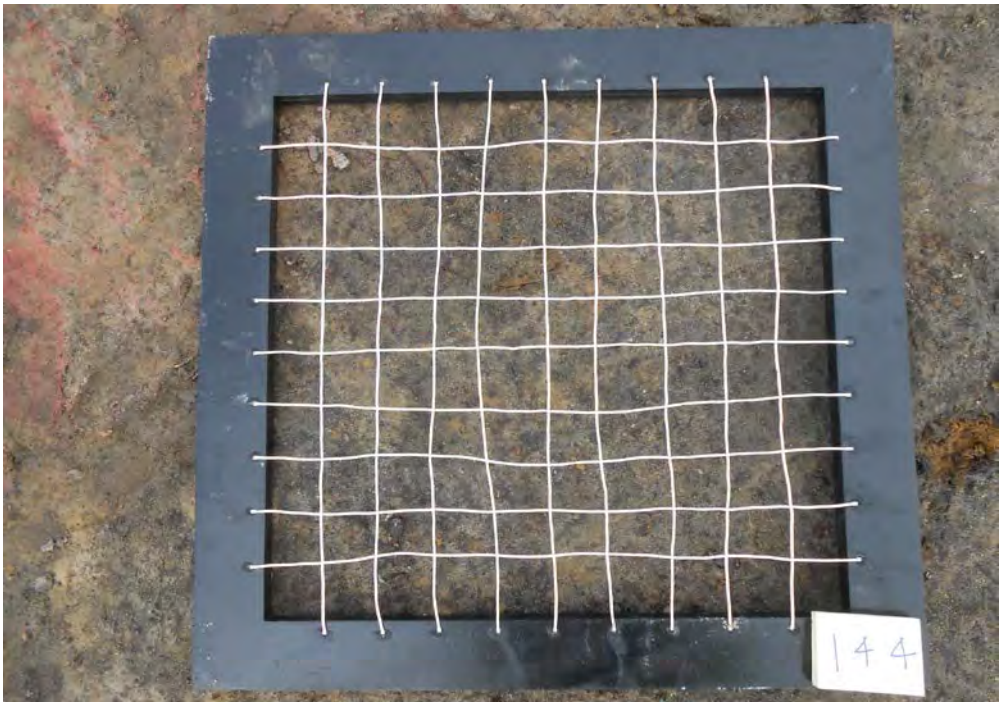
Brown silty fine sand with trace gravel and sticks

Brown silty fine sand

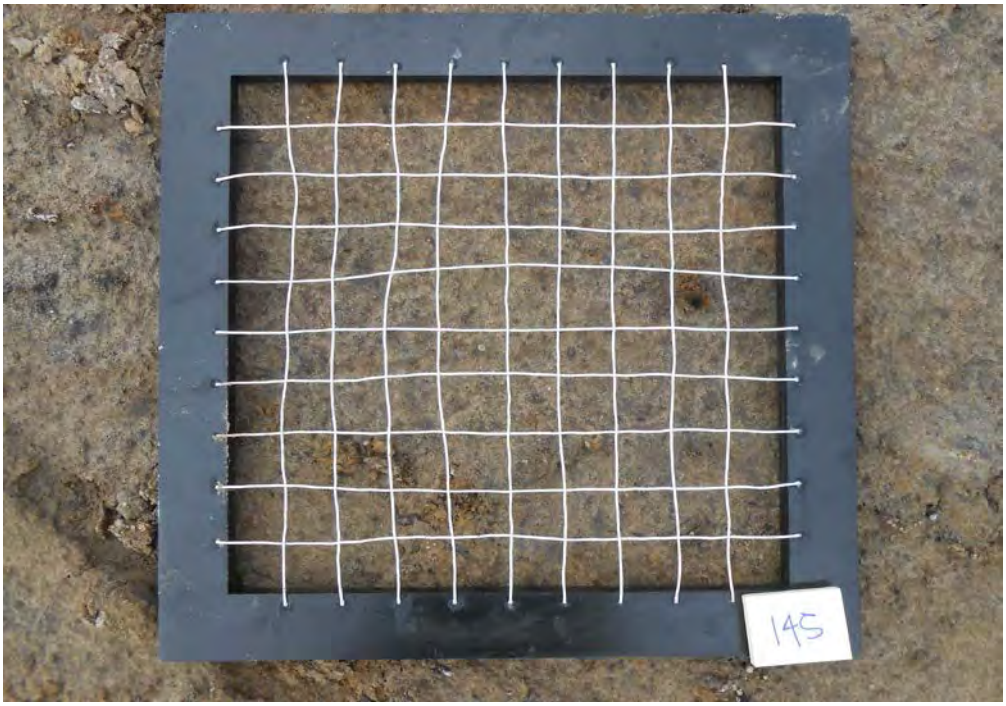


Varegated gray-orange silty fine sand with trace gravel and roots

Variegated light gray-brown silty fine sand with trace gravel



Variegated light gray-brown silty fine sand with trace coarse gravel roots and sticks



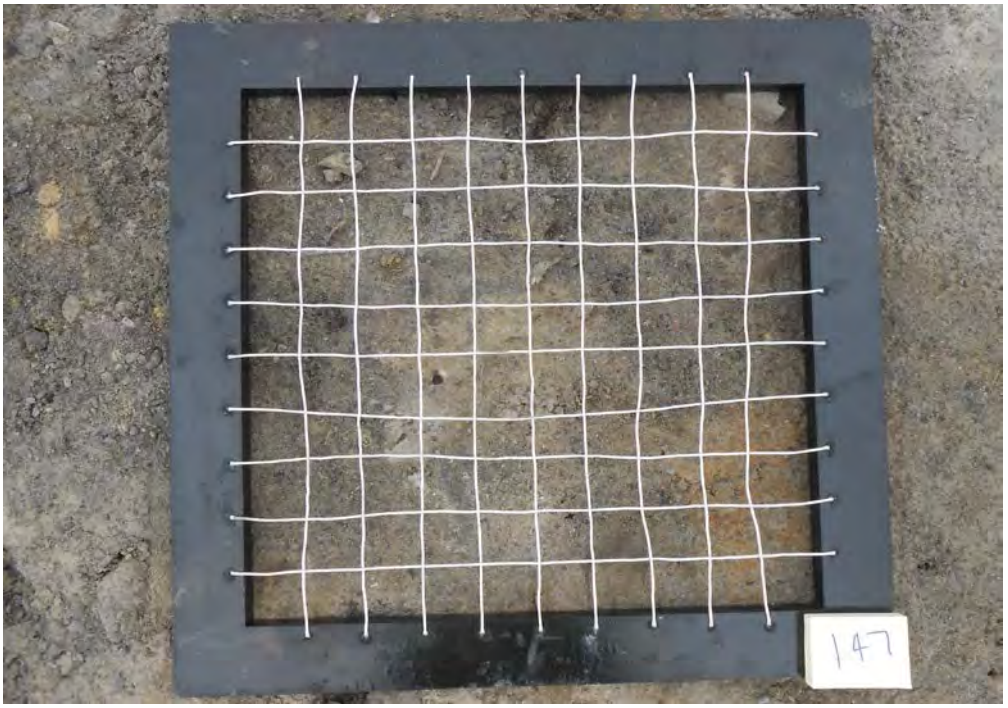
Variegated gray-orange silty fine sand with trace sticks

Variegated gray-orange silty fine sand with trace gravel and sticks

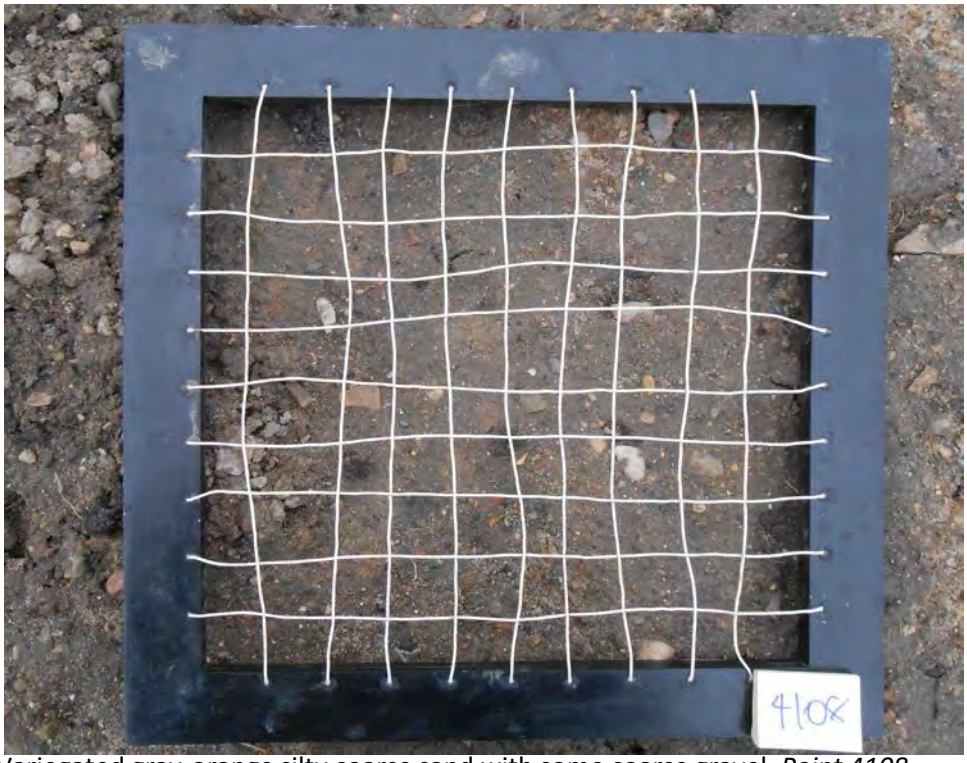
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 147, 148



Variegated gray-orange silty fine sand with trace gravel and sticks and roots

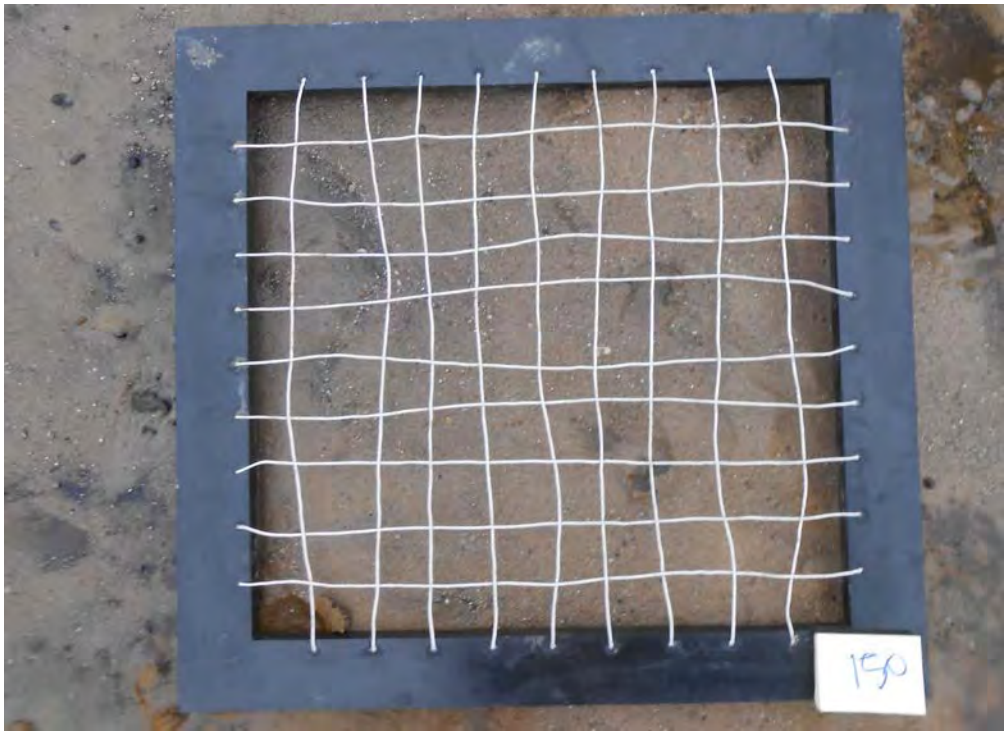


Variegated gray-orange silty coarse sand with some coarse gravel. *Point 4108 was renumbered to 148 during construction due to the location of the point being outside ash boundaries*

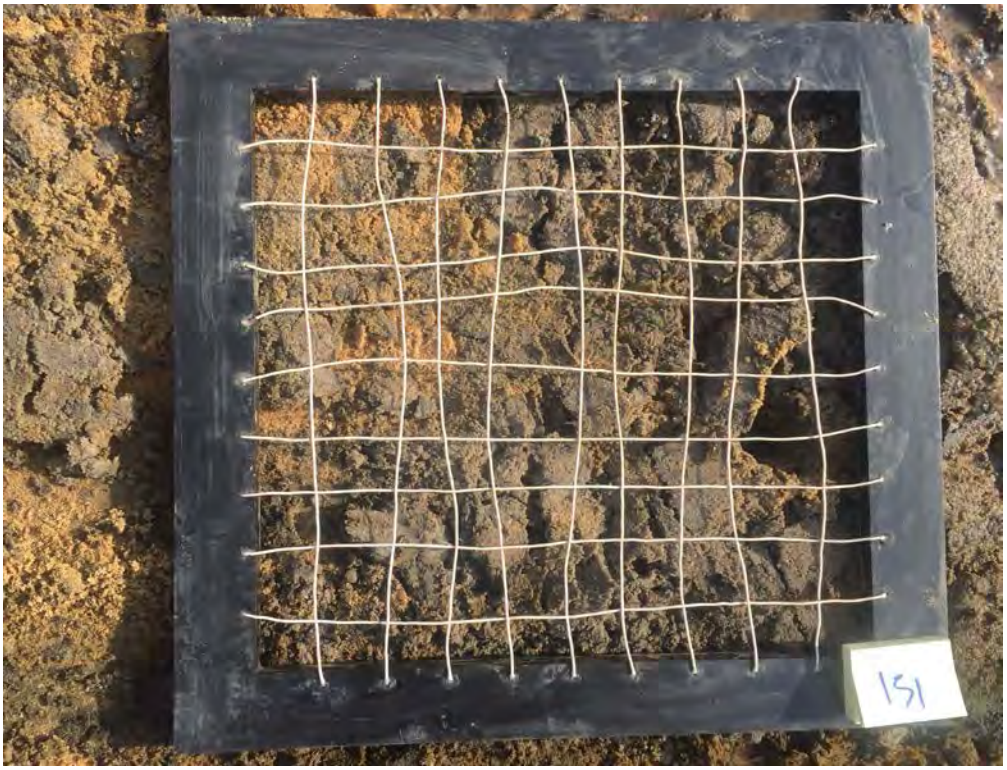
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

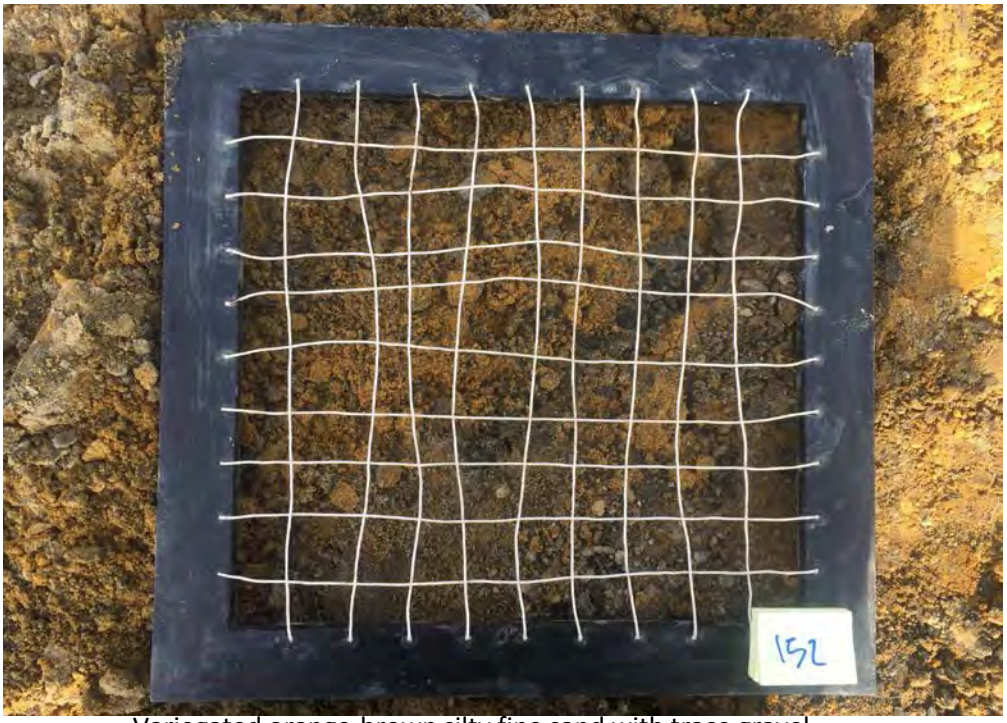
Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 150
151



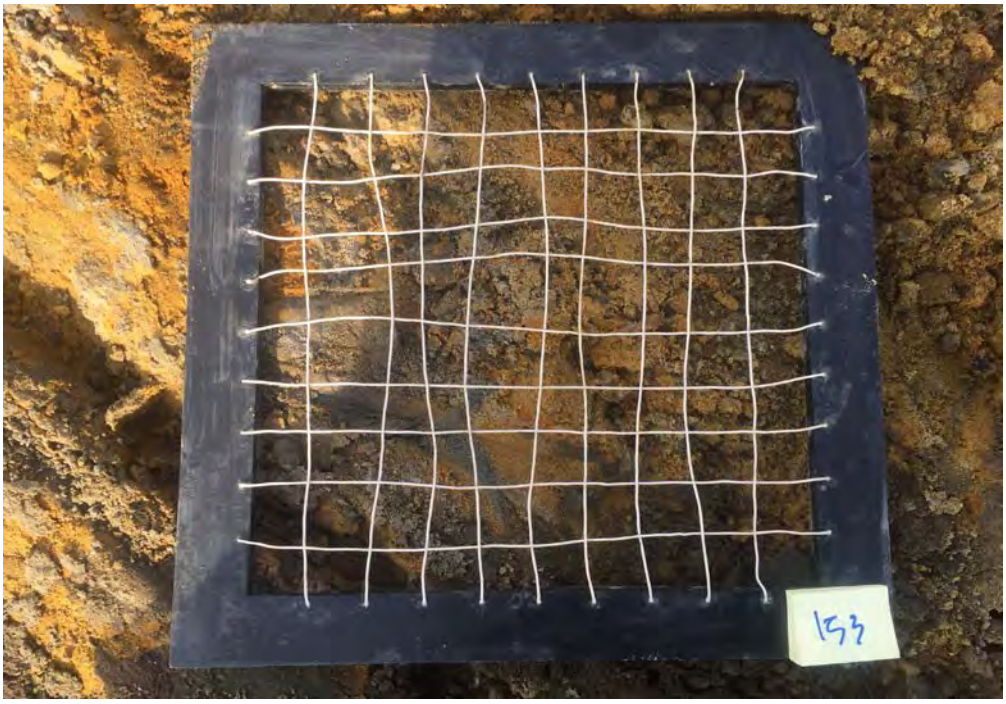
Light brown silty fine sand with trace gravel



Variegated orange-brown silty fine sand



Variegated orange-brown silty fine sand with trace gravel

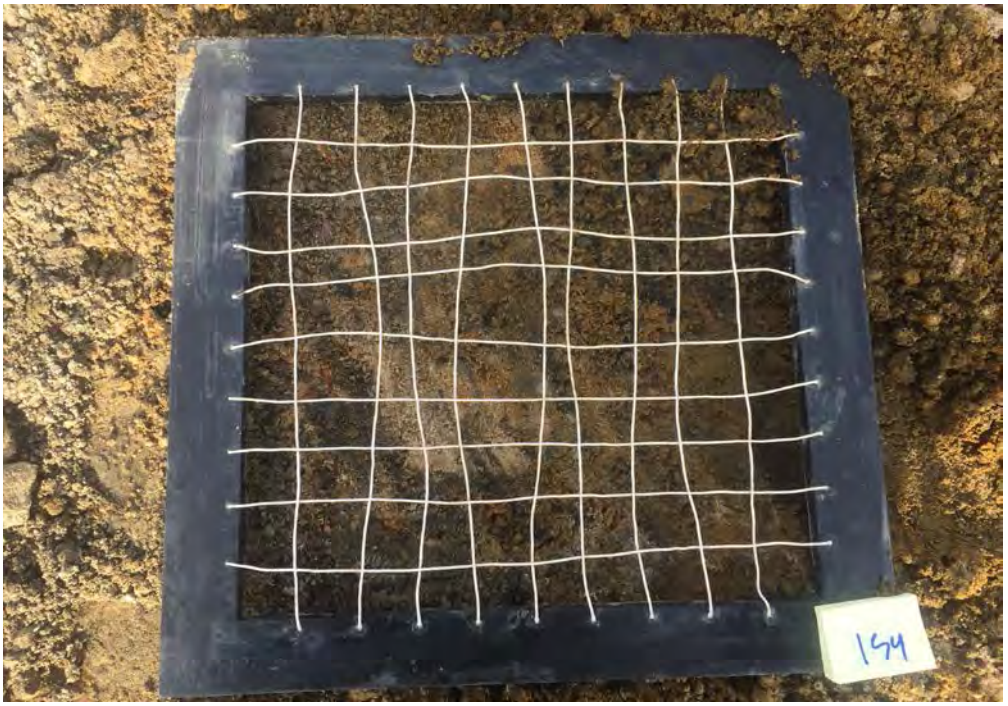


Variegated orange-brown silty fine sand with trace coarse gravel

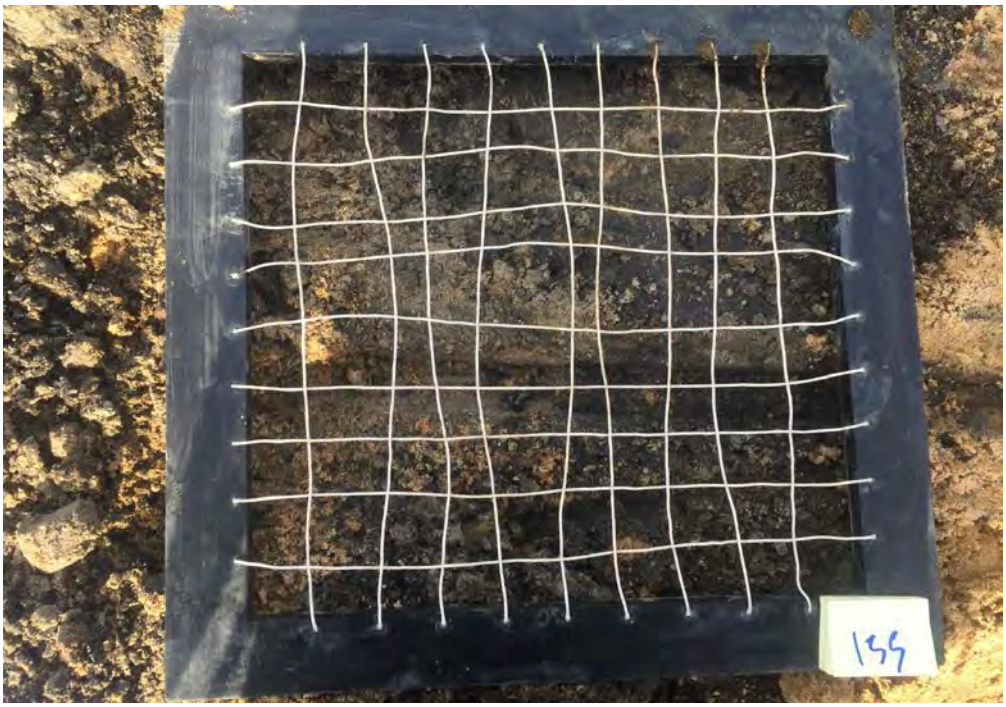
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 154, 155



Variegated orange-brown silty fine sand with trace coarse gravel

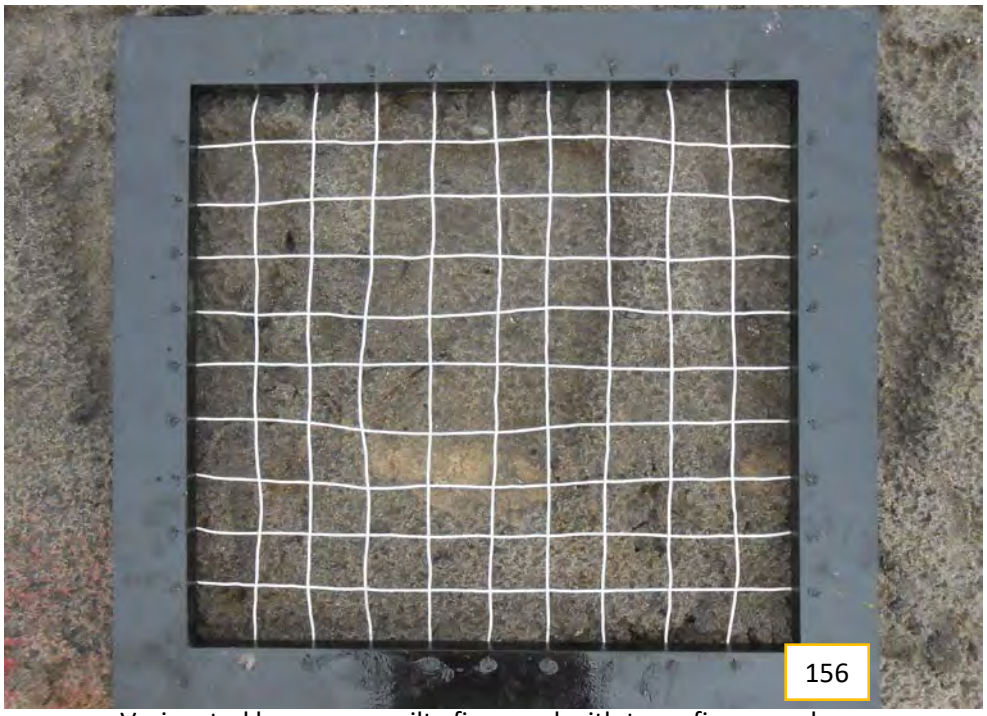


Variegated light brown - dark gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

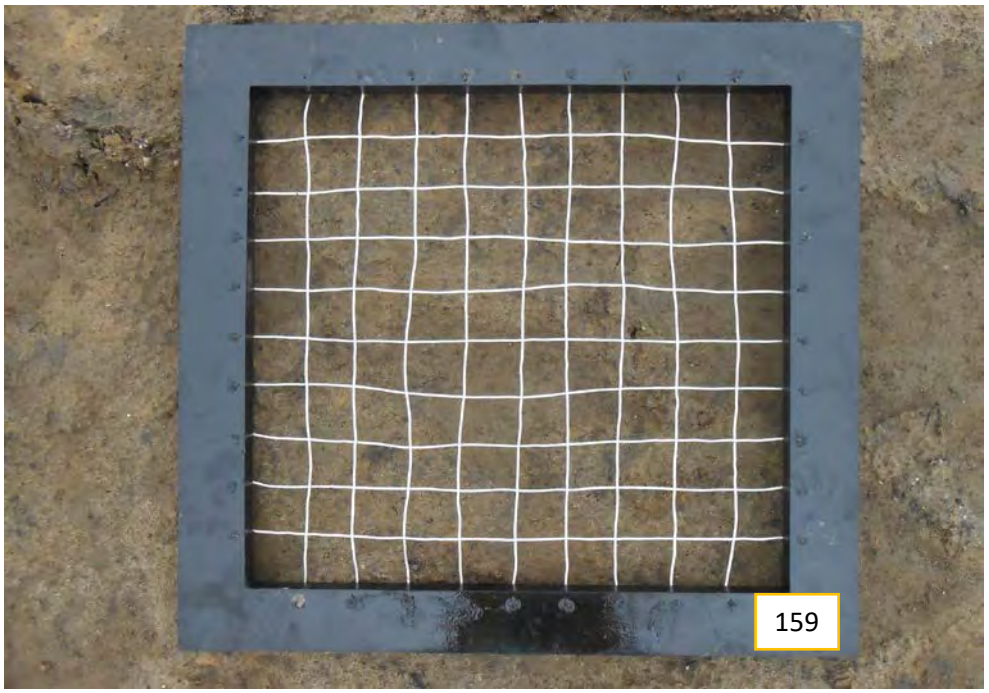
Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 156, 157



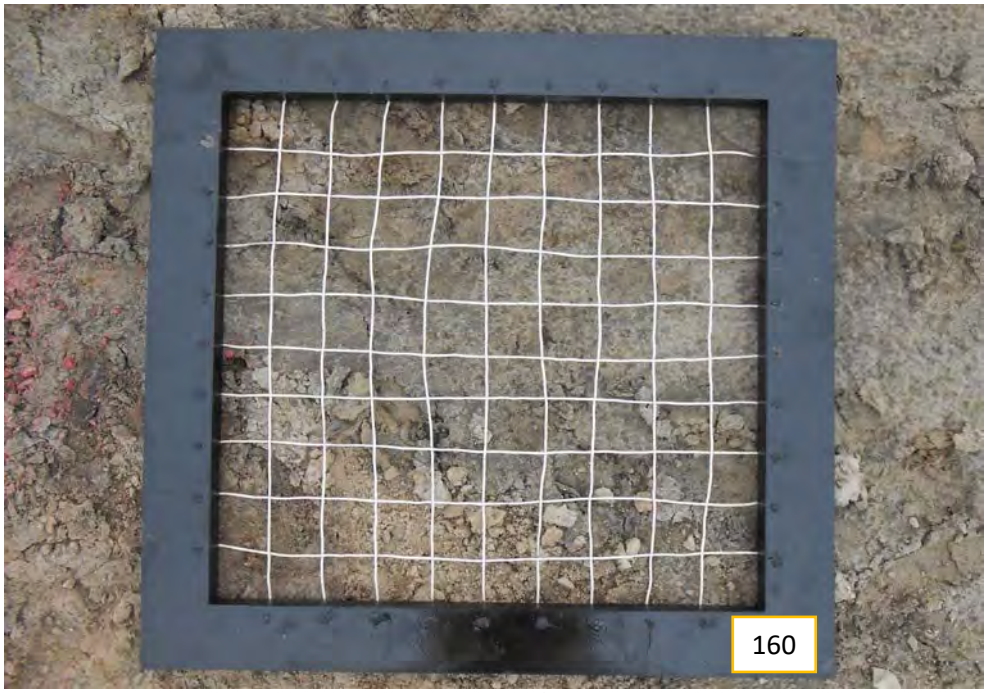
Variegated brown-gray silty fine sand with trace fine gravel

Variegated brown-gray silty fine sand with trace fine gravel

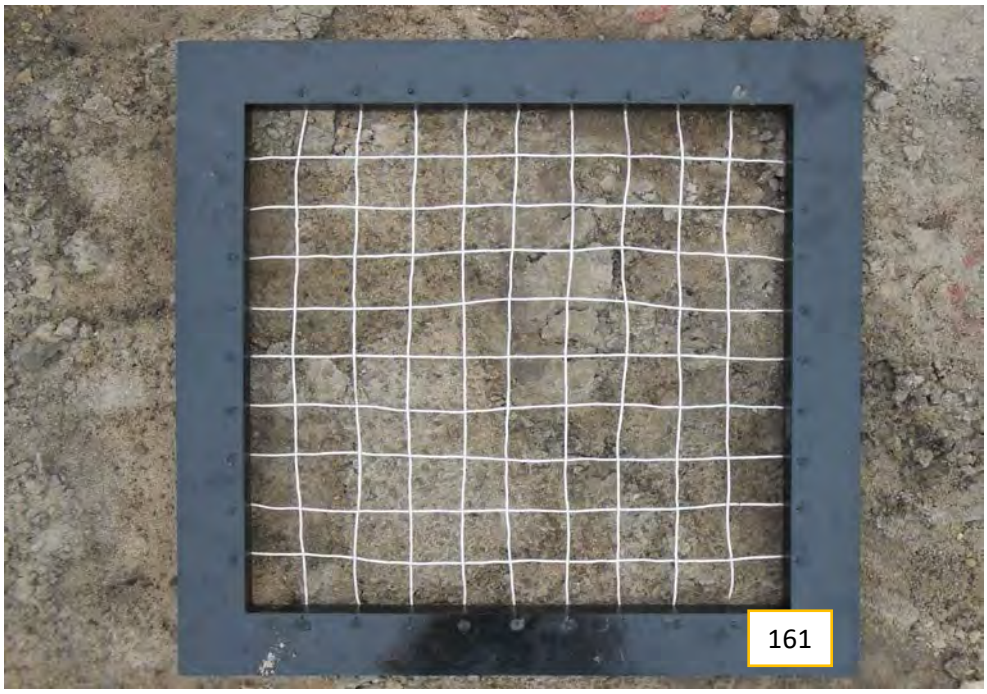
Variegated brown-gray silty fine sand



Variegated brown-gray silty fine sand with trace fine gravel

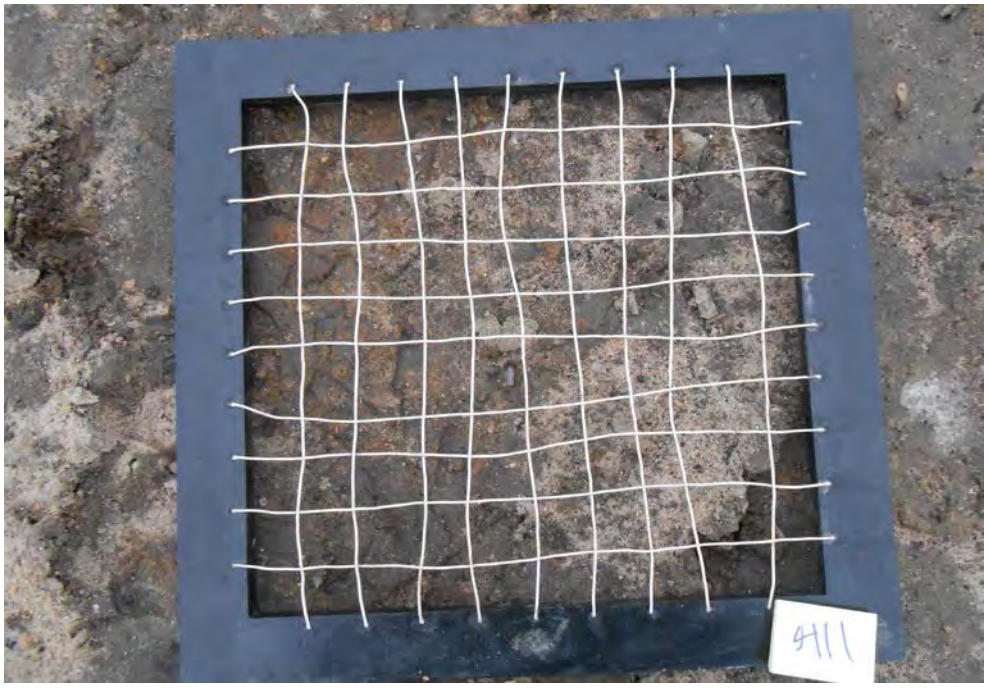


Variegated light gray-light brown silty fine sand with trace gravel



Variegated light gray-light brown silty fine sand with trace gravel and sticks

Variegated light gray-light brown silty fine sand with trace gravel and sticks



Variegated gray-brown silty fine sand with trace gravel and sticks. *Point 4111 was renumbered to 164 during construction due to the location of the point being outside ash boundaries.*

Engineering & Environmental Solutions, LLC

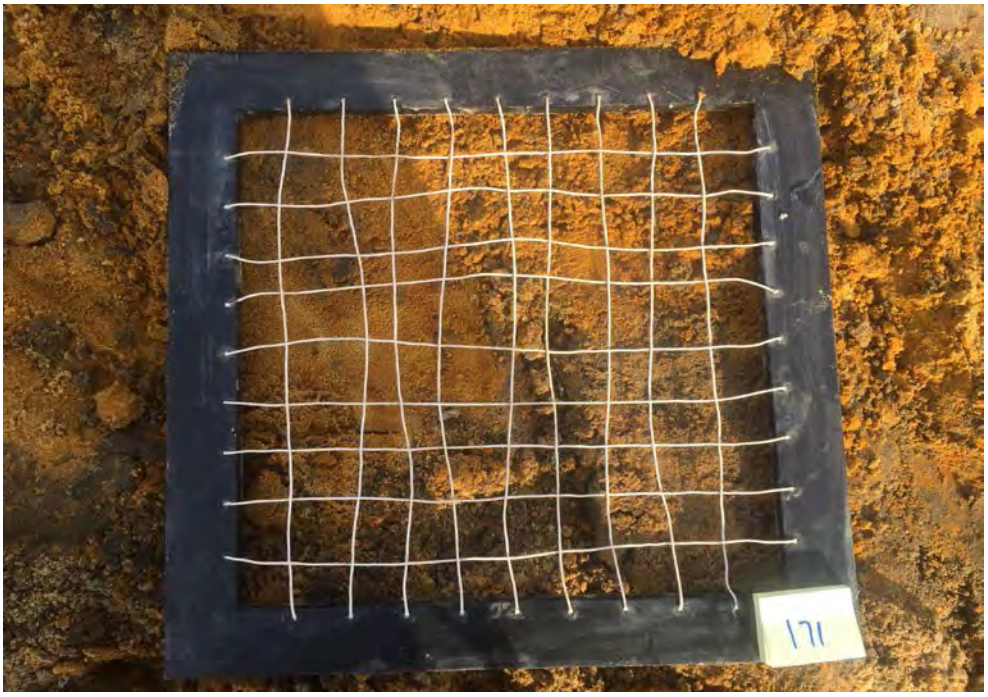
Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 168, 169

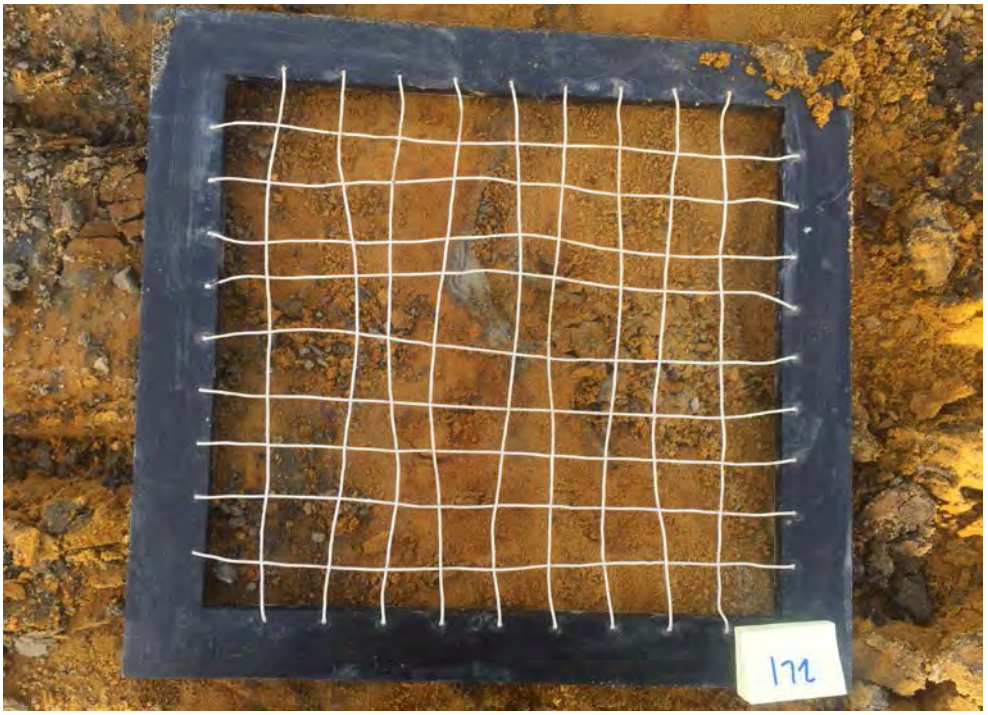
Variegated brown-orange silty fine sand with trace coarse gravel

Brown silty fine sand with trace clay

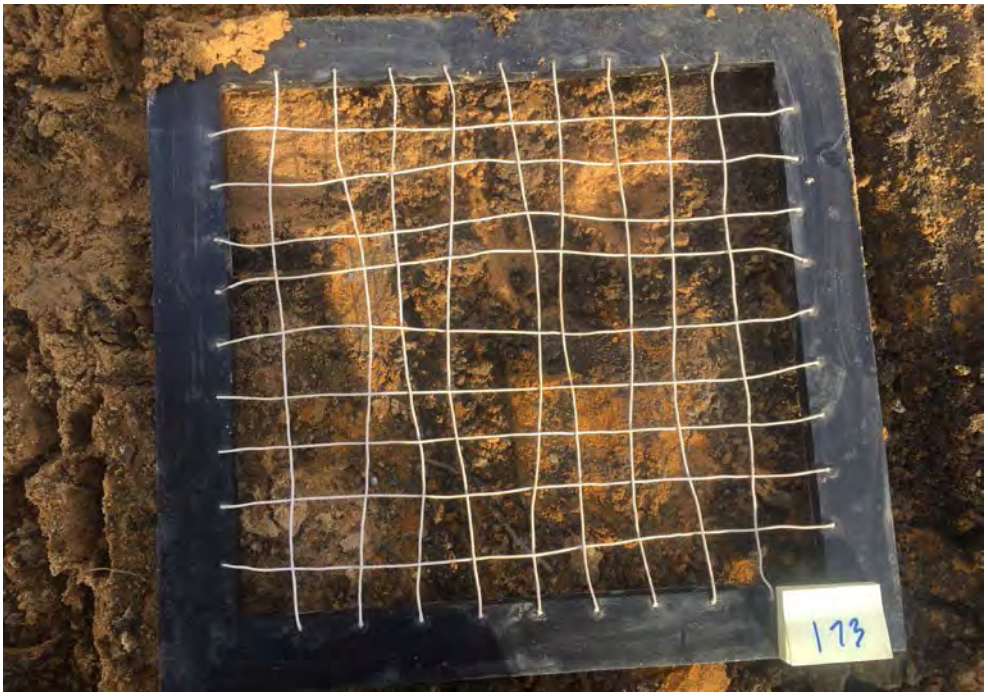
Brown silty fine sand with trace clay



Variegated orange-brown silty fine sand with trace gravel

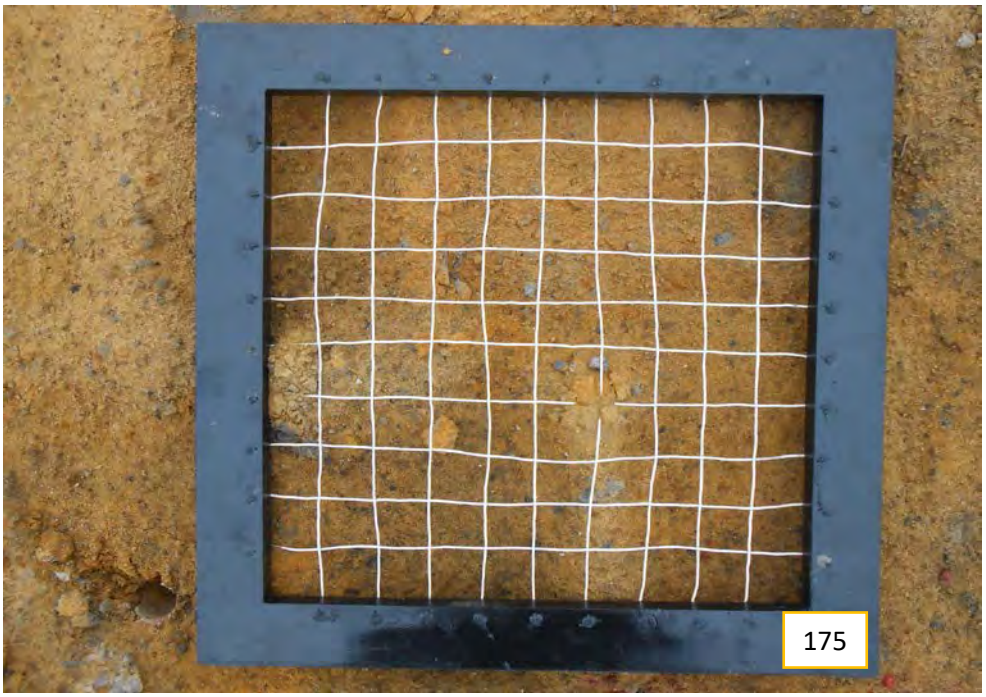


Variegated orange-brown silty fine sand with trace gravel



Variegated orange-brown silty fine sand with trace gravel

Variegated orange-brown silty fine sand with trace gravel and roots



Orange silty fine sand with trace gravel

Variegated brown-gray silty fine sand with trace gravel

Variegated brown-gray silty fine sand with trace gravel

Variegated brown-gray silty fine sand with trace gravel

Gray silty fine sand with trace fine gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 180
183

Gray silty fine sand with trace gravel and roots

Variegated gray-orange silty fine sand with some coarse gravel. *Point 4113 was renumbered to 183 during construction due to the location of the point being outside ash boundaries*

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 186, 187

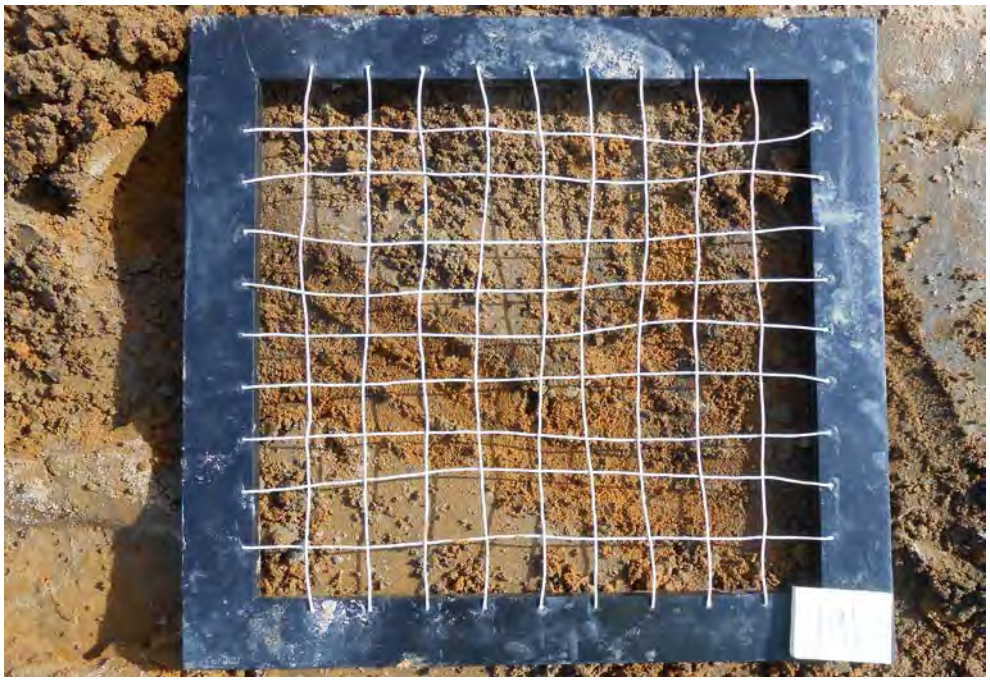
Variegated gray-brown silty fine sand with trace coarse gravel

Variegated gray-brown silty fine sand

Variegated gray-brown silty fine sand

Variegated gray-brown silty fine sand with trace gravel

Variegated orange-brown silty fine sand



Variegated orange-brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

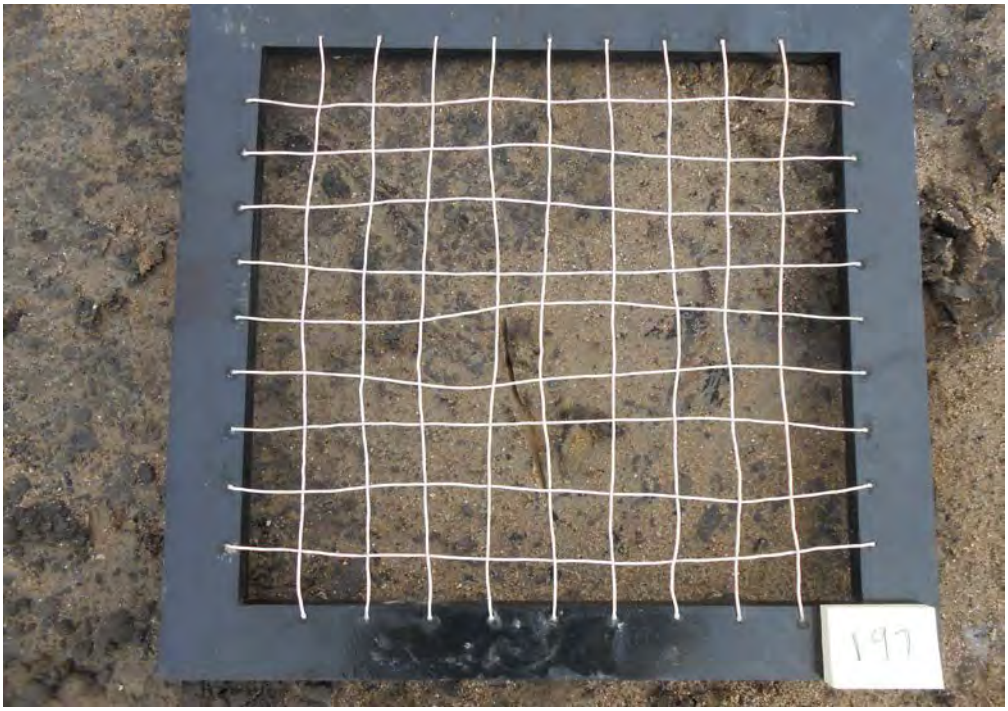
Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 192, 193

Brown silty fine sand

Light brown silty fine sand

Light brown silty fine sand with trace gravel

Variegated orange-brown-gray silty fine sand with grace gravel

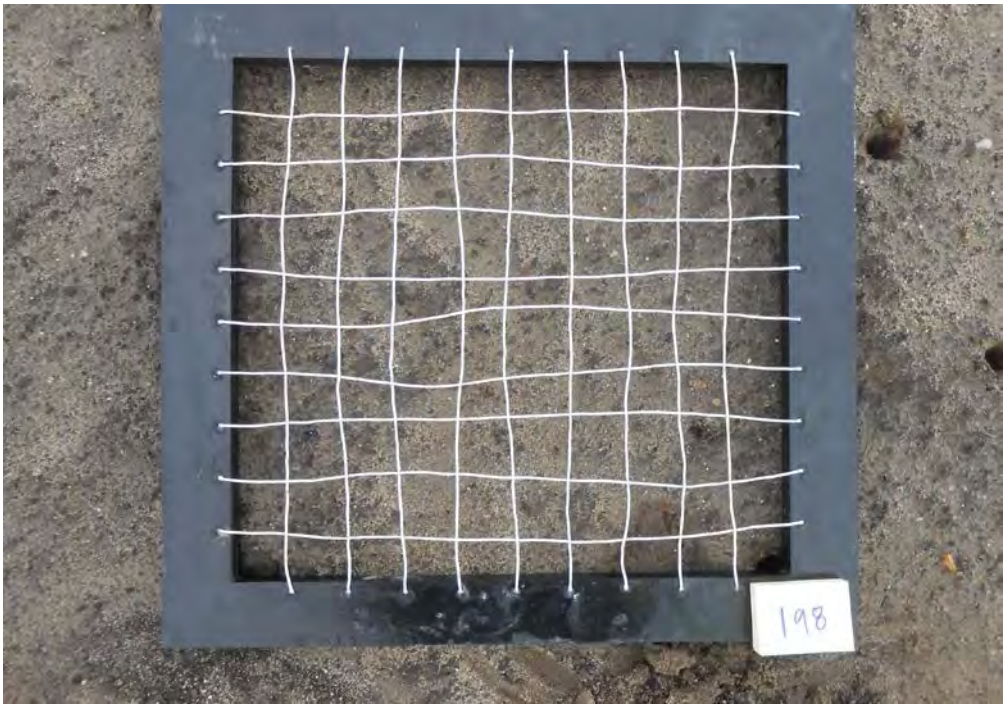


Variegated light brown-gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 198, 199



Gray silty fine sand with trace gravel

Brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 201, 204

Light brown silty fine sand with some coarse gravel. *Point 4116 was renumbered to 201 during construction due to the location of the point being outside ash boundaries.*

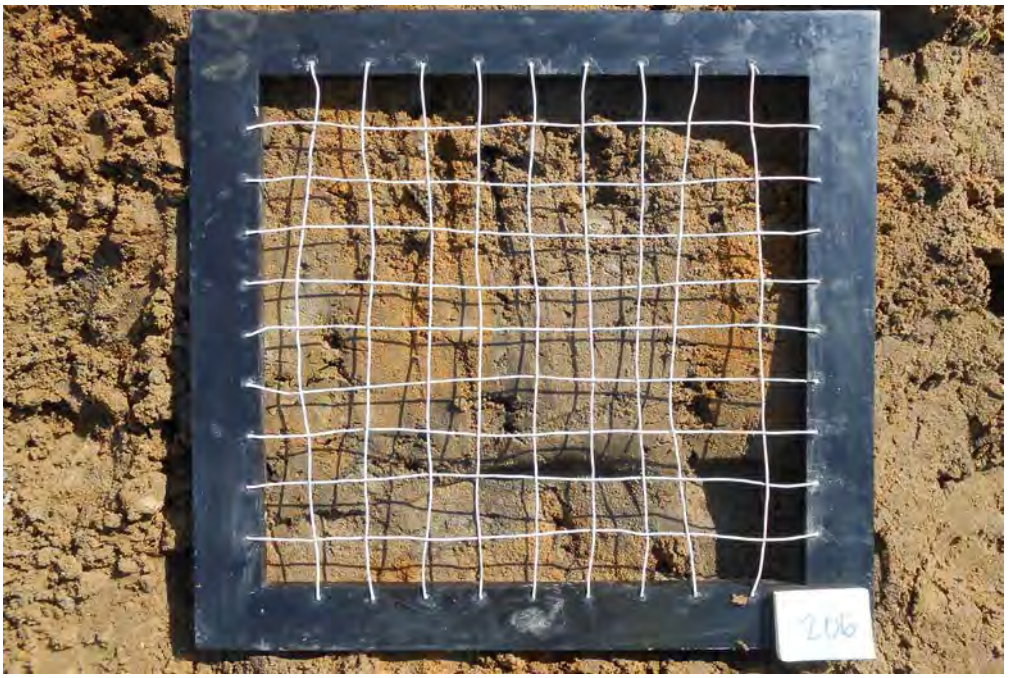
Variegated brown-orange silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 205, 206

Brown silty fine sand

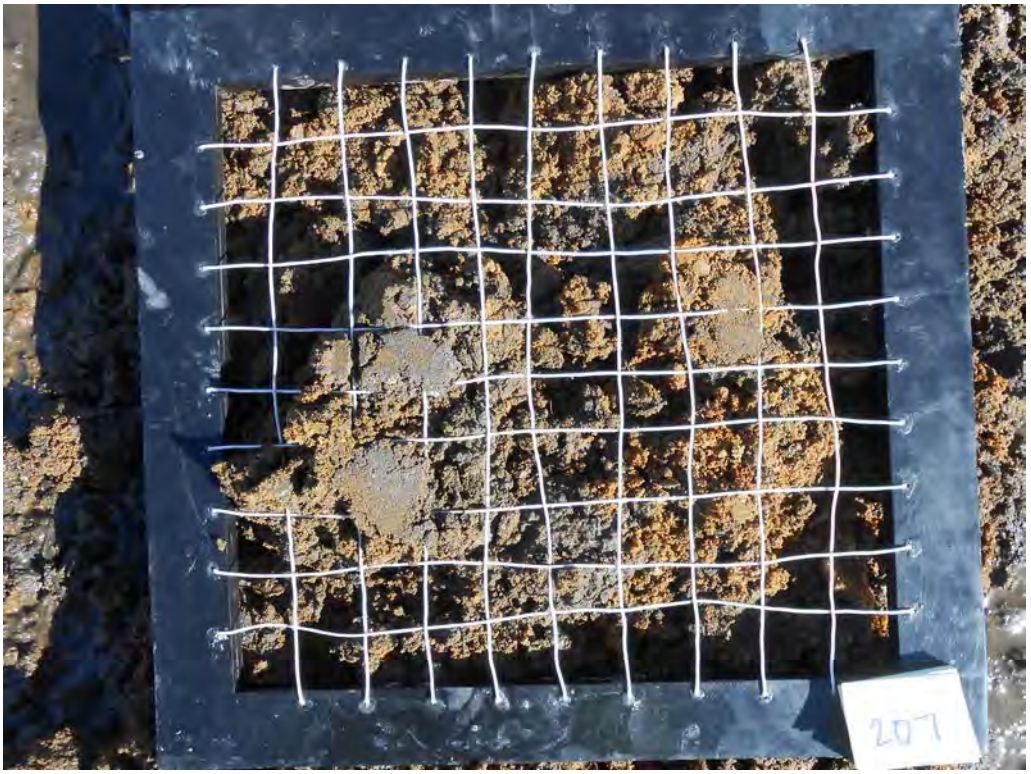


Brown silty fine sand with trace gravel and clay

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 207, 208



Variegated orange-gray silty fine sand with trace clay

Variegated orange-brown fine silty sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 210, 211

Brown silty fine sand with trace gravel

Light orange silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 212, 213

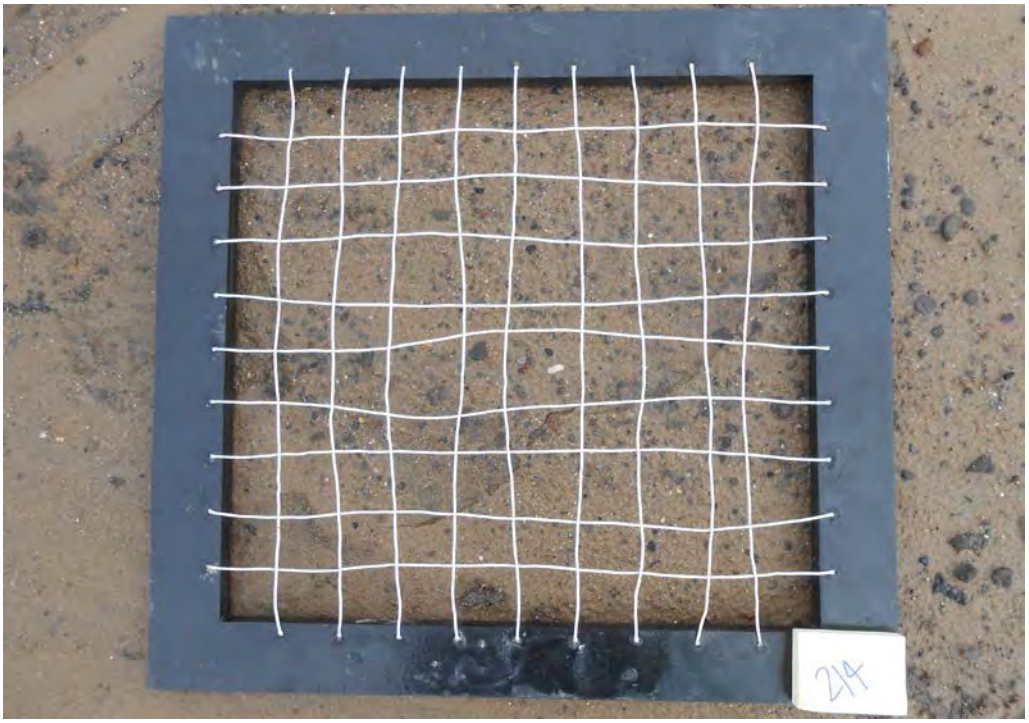
Light brown silty fine sand with trace fine gravel

Variegated light brown-orange silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 214, 215



Brown silty fine sand with trace gravel

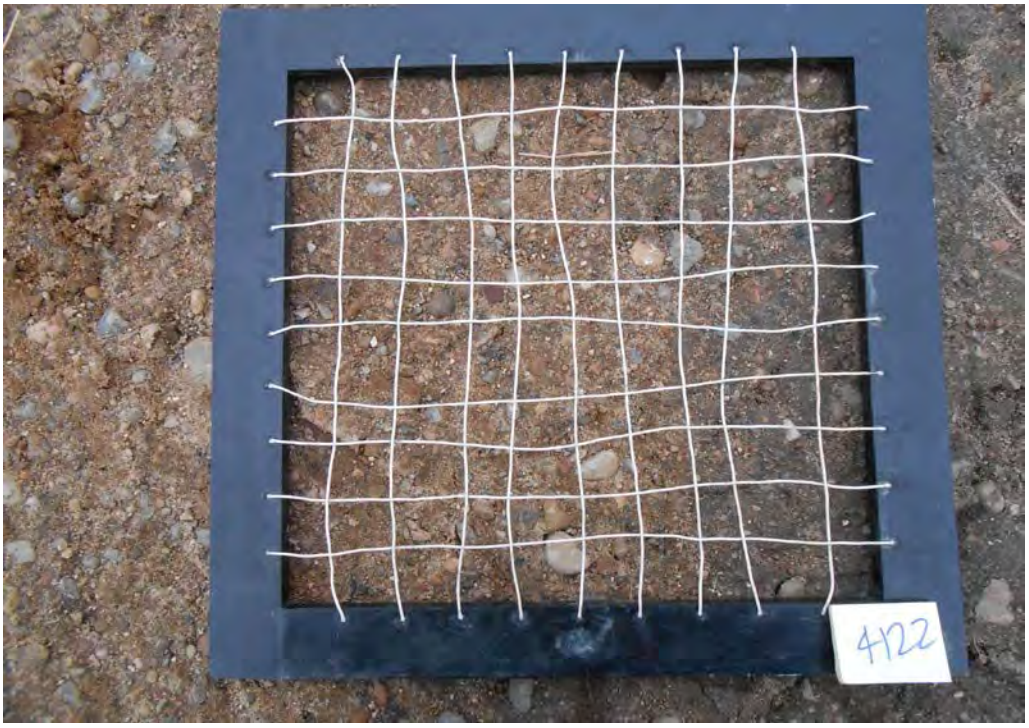
Brown silty fine sand with trace gravel and sticks

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 216, 218

Variegated light brown-dark gray silty fine sand with trace gravel

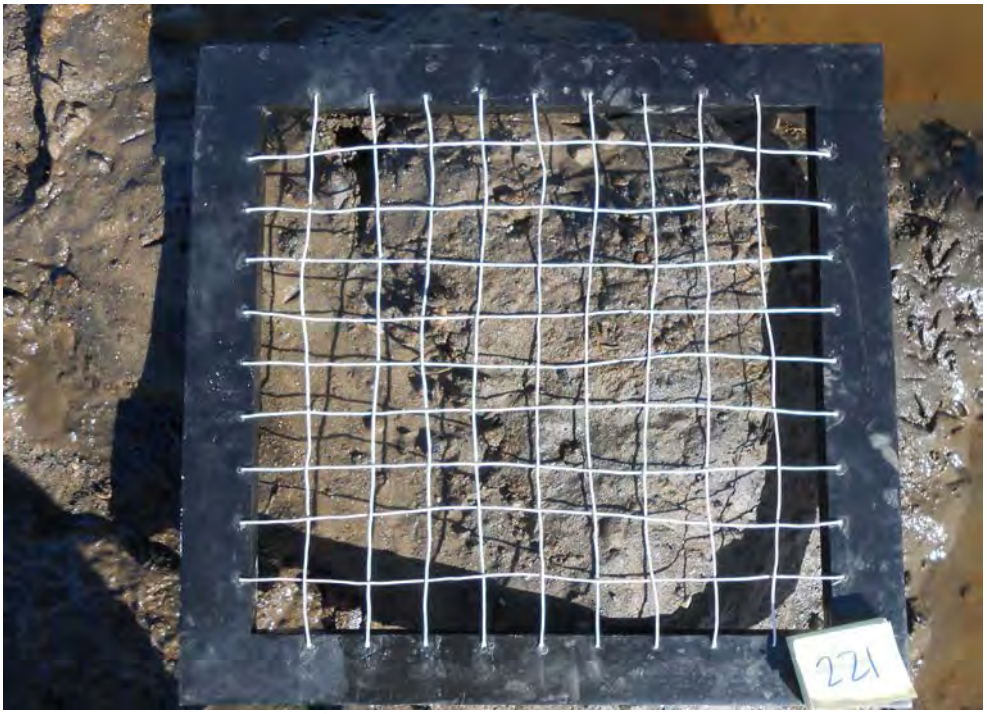


Variegated light brown-dark gray silty fine sand with some coarse gravel. *Point 4122 was renumbered to 218 during construction due to the location of the point being outside ash boundaries.*

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 221, 222



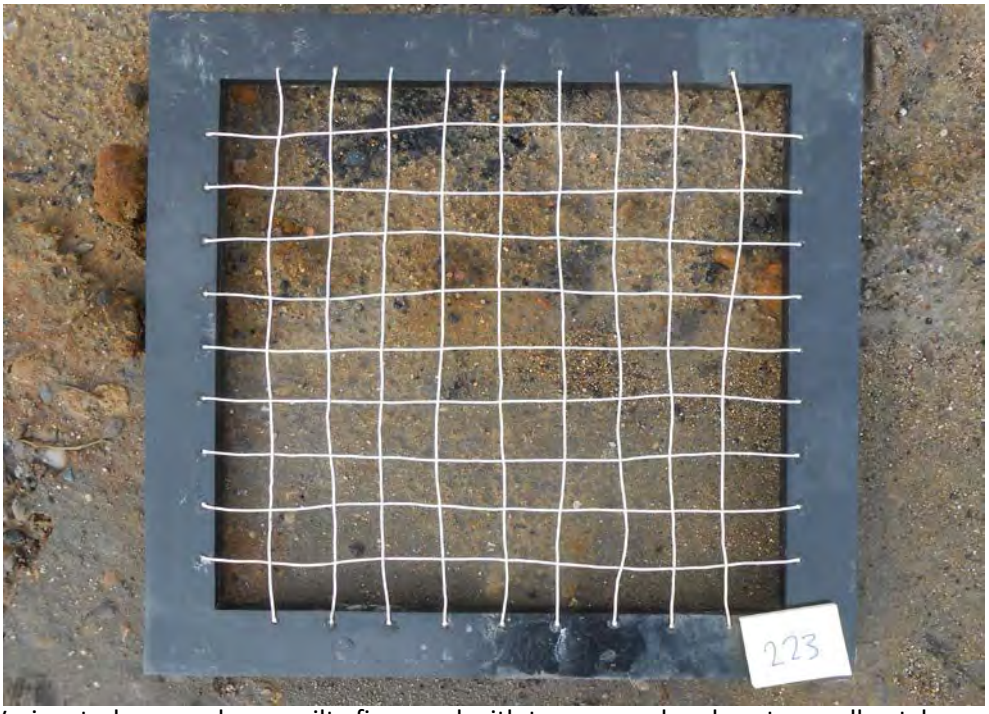
Brown silty fine sand with trace gravel and roots

Orange silty fine sand with trace gravel and roots

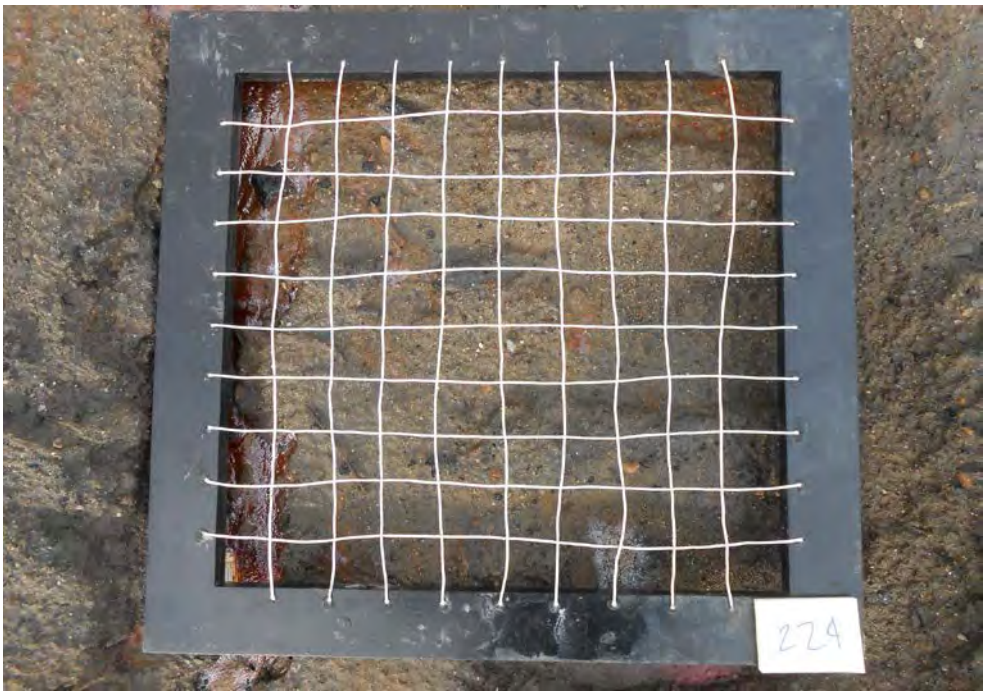
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

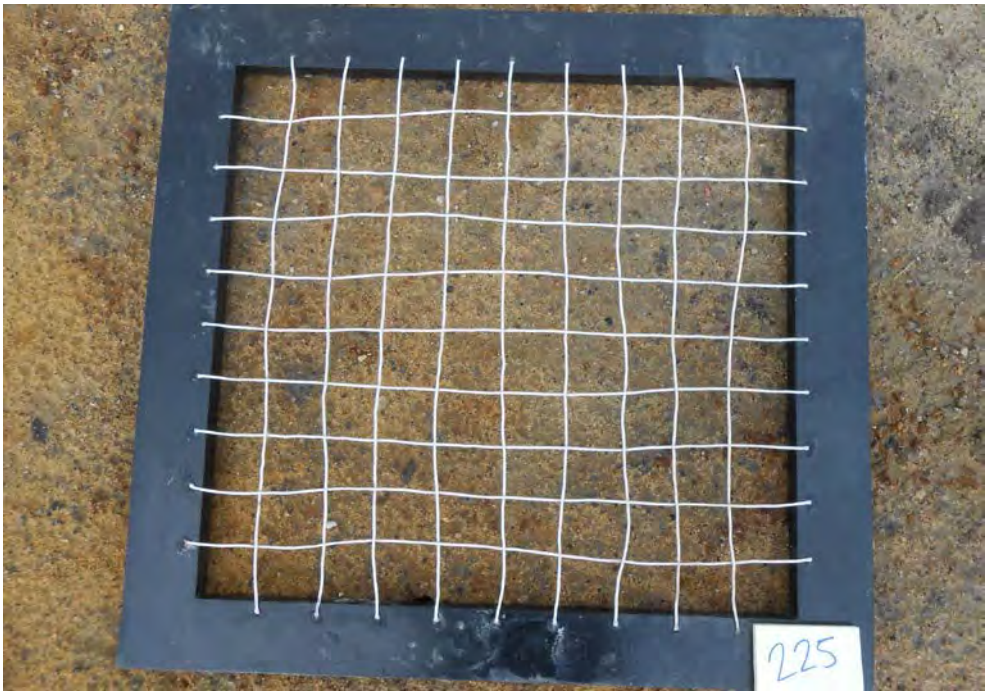
Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 223, 224



Variegated orange-brown silty fine sand with trace gravel and roots; small patch of coal (less than 5%)



Variegated orange-brown silty fine sand with trace gravel and roots



Brown silty fine sand with trace fine gravel

Brown silty fine sand with trace gravel

Light brown silty fine sand with trace fine gravel

Brown silty fine sand with trace fine gravel

Brown silty fine sand with trace gravel

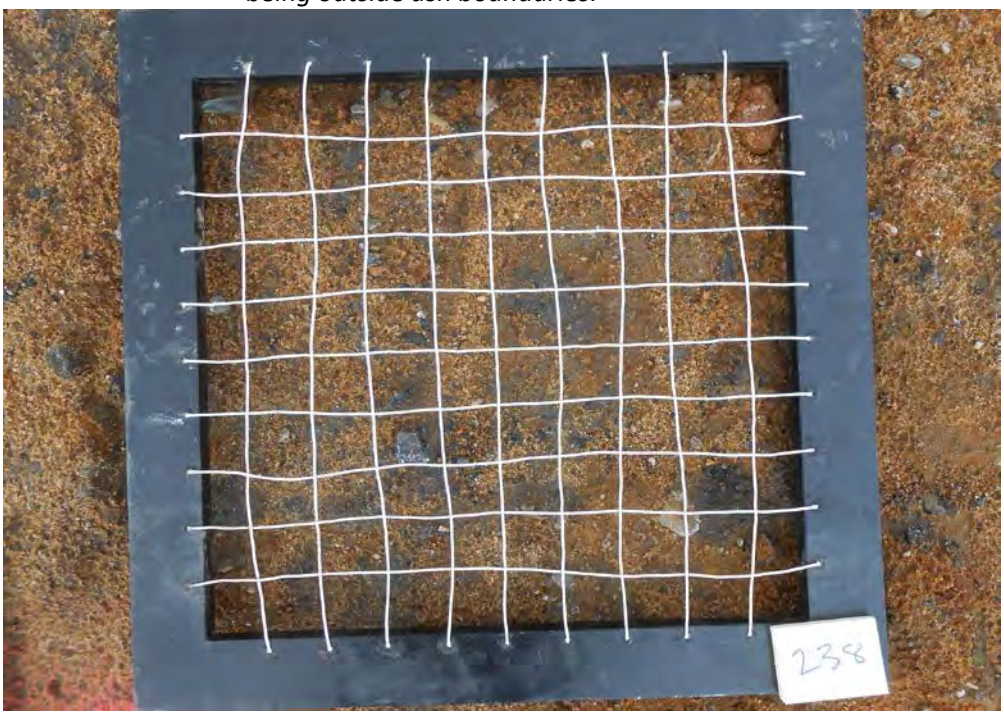
Variegated orange-gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

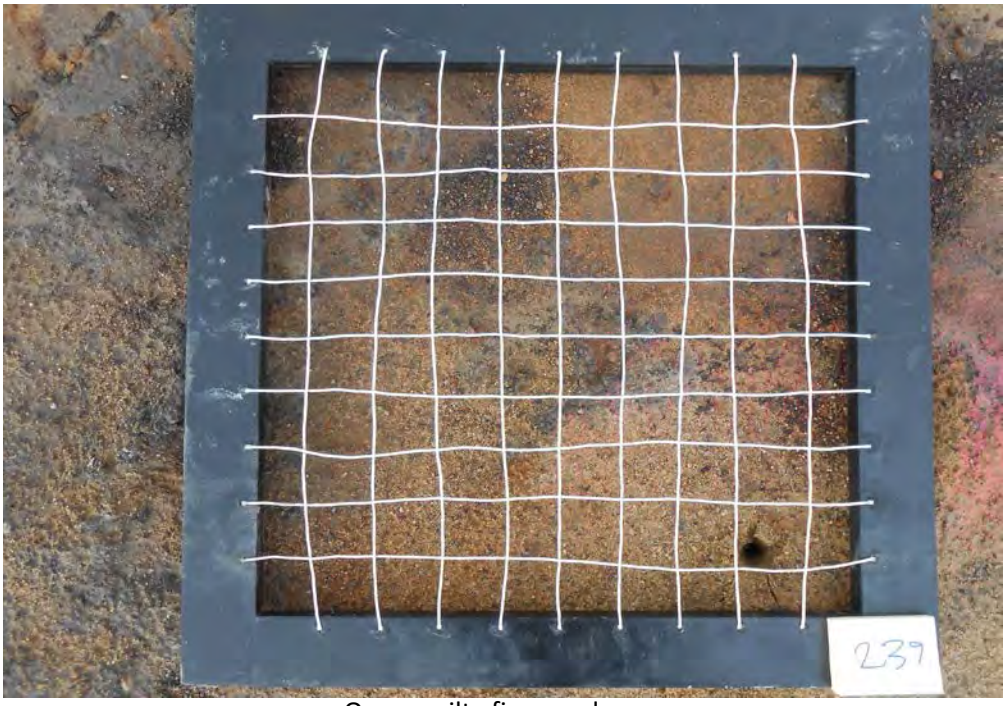
Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 233, 238

Variegated light brown-dark gray silty fine sand with some coarse gravel. *Point 4170 was renumbered to 233 during construction due to the location of the point being outside ash boundaries.*



Orange silty fine sand with trace gravel



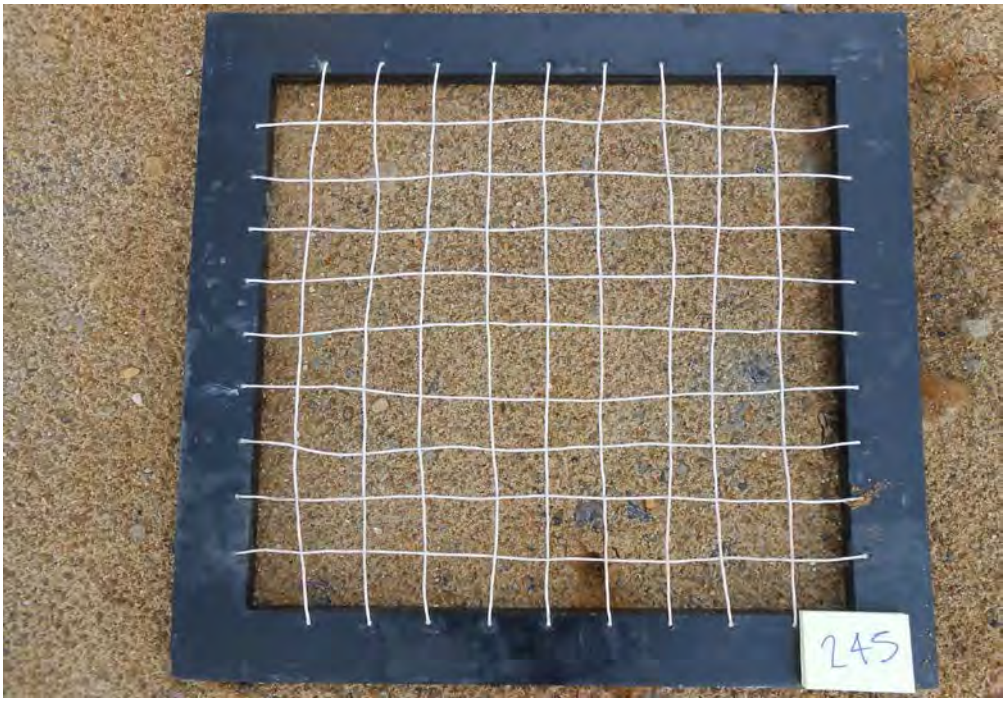
Orange silty fine sand

Variegated orange-gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

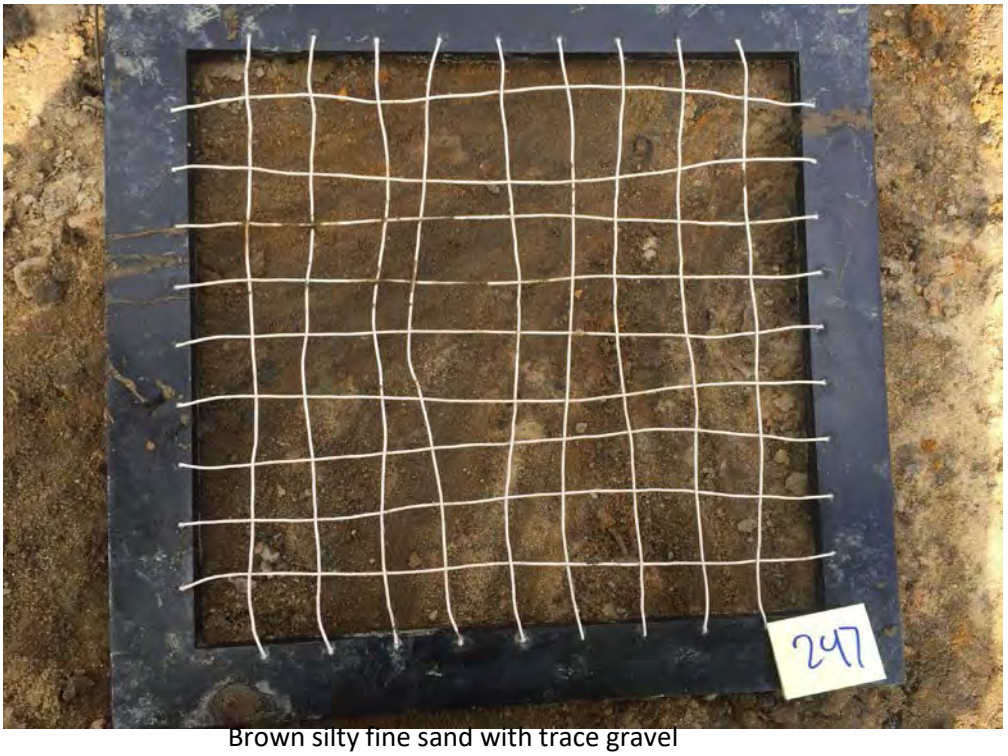
Documentiaton Pictures

Project: Holland BPW Coal Yard Closure Project No: 133-17-001 Points: 245, 246



Brown silty fine sand with trace fine gravel

Orange silty fine sand with trace fine gravel



Brown silty fine sand with trace gravel

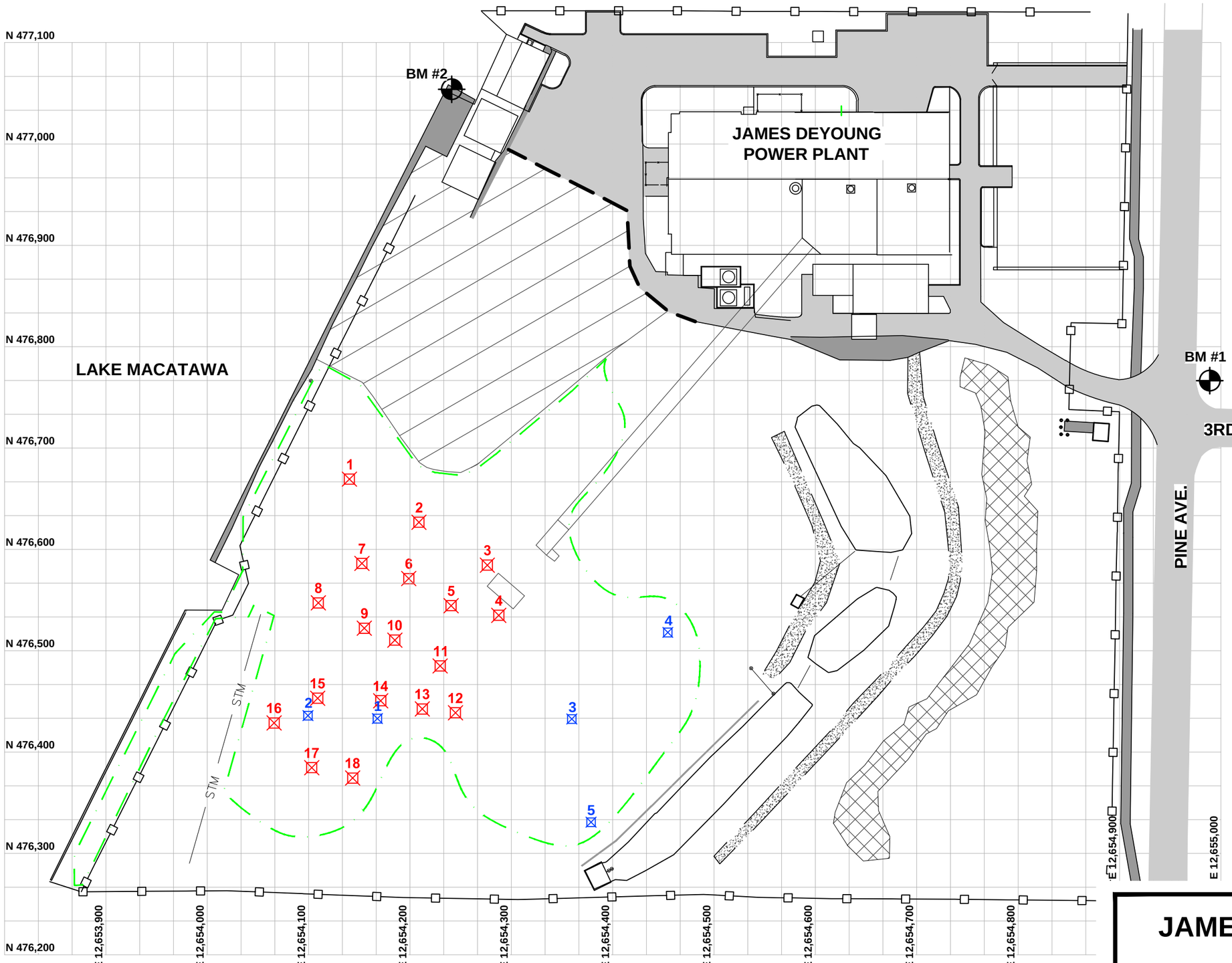
Light brown silty fine sand

Brown silty fine sand with trace gravel and roots

Brown silty fine sand with trace gravel and roots

APPENDIX B.2

FIELD DENSITY TESTING LOCATIONS



LEGEND

- APPROXIMATE LIMITS OF COAL/SOIL MIX
- EXISTING FENCE
- EXISTING BENCHMARK
- EXISTING LANDSCAPING
- DENSITY TEST LOCATION - 12/7/2017
- DENSITY TEST LOCATION - 5/4/2018

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

N

DRAFT

JAMES DEYOUNG POWER PLANT

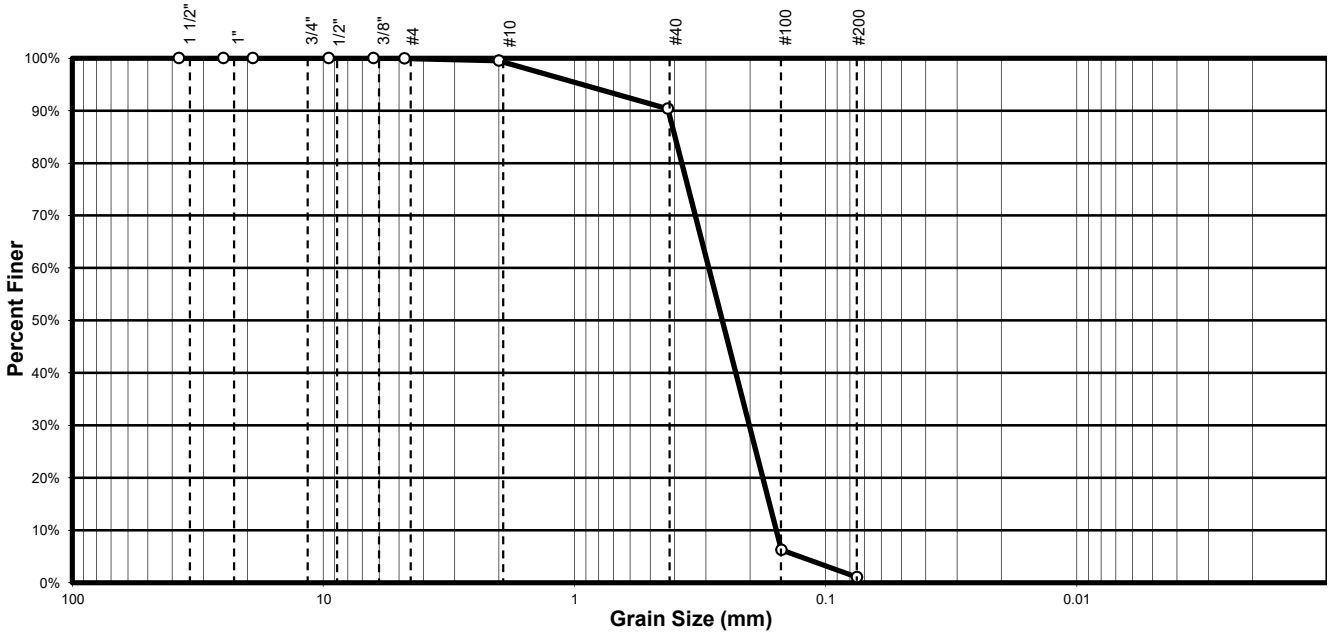
TROXLER DENSITY GAUGE - TESTING LOCATIONS

SCALE	1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET			1A	

APPENDIX C.1.1

PRELIMINARY FILL TEST RESULTS

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	9.2	89.3	1.1	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	100.0%		
1/4"	100.0%		
#4	99.9%		
#10	99.5%		
#40	90.4%		
#100	6.3%		
#200	1.1%		

Material Description

Brown, mostly fine Sand

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.07 Cc= 3.714

D_{30}= 0.15 Cu= 0.084

D_{60}= 0.26

Classification

Remarks

Sample ID: s-01	Client: Holland BPW
Lab ID:	Project: Coal Yard Closure

Engineering & Environmental Solutions Project Number: 133-17-001

Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B, Holland, Michigan 49424

Memorandum

To	Jane Monroe		
Company	Holland BPW		
From	Kurt Van Appledorn, P.G.	*Project Number*	133-17-001
Date	September 20, 2017		

Re: Fill Sand for James DeYoung Coal Yard

Jane:

The stockpile of sand that is intended to be utilized for the Holland BPW James DeYoung coal yard project was sampled for Michigan 10 metals on September 7, 2017. The sand samples were collected from a sand pit operation located north of Croswell Street and east of 152nd Avenue in Port Sheldon Township. The laboratory results were compared to Part 201 Generic Cleanup Criteria. All metals with detectable levels were found to be below the Statewide Default Background Levels and Residential Drinking Water Protection Criteria. Copies of the laboratory results are attached.

If you have any questions, please call me at 616-566-7542 or email me a kurt.vanappledorn@goeesolutions.net.

Kurtis J Van Appledorn, P.G.
Project Manager

18-Sep-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **Ryan Inc** Work Order: **1709340**

Dear Blaine,

ALS Environmental received 4 samples on 07-Sep-2017 04:07 PM 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 industry accepted practices and Quality Control 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 15.

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

ALS Group, USA

Date: 18-Sep-17

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: **1709340**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1709340-01	S-1	Soil		9/7/2017 15:31	9/7/2017 16:07	☐
1709340-02	S-2	Soil		9/7/2017 15:33	9/7/2017 16:07	☐
1709340-03	S-3	Soil		9/7/2017 15:37	9/7/2017 16:07	☐
1709340-04	S-4	Soil		9/7/2017 15:39	9/7/2017 16:07	☐

ALS Group, USA

Date: 18-Sep-17

Client: Engineering & Environmental Solutions
Project: Ryan Inc
WorkOrder: **1709340**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: 18-Sep-17

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340

Case Narrative

Samples for the above noted Work Order were received on 9/7/2017. 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. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Metals:
No other deviations or anomalies were noted.

Wet Chemistry:
No other deviations or anomalies were noted.

ALS Group, USA

Date: *18-Sep-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340
Sample ID: S-1
Lab ID: 1709340-01
Collection Date: 9/7/2017 03:31 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/13/17 15:45		Analyst: **RSH**
Mercury	ND		0.016	mg/Kg-dry	1	9/14/2017 12:27 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/11/17 11:54		Analyst: **RH**
Arsenic	ND		0.46	mg/Kg-dry	1	9/11/2017 07:32 PM
Barium	**3.7**		**0.46**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
Cadmium	ND		0.93	mg/Kg-dry	1	9/11/2017 07:32 PM
Chromium	**1.7**		**0.46**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
Copper	**0.93**		**0.93**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
Lead	**0.71**		**0.46**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
Selenium	ND		0.93	mg/Kg-dry	1	9/11/2017 07:32 PM
Silver	ND		0.46	mg/Kg-dry	1	9/11/2017 07:32 PM
Zinc	**3.9**		**0.93**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
MOISTURE			**SW3550C**			Analyst: **BTG**
Moisture	**17**		**0.050**	**% of sample**	1	9/13/2017 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *18-Sep-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340
Sample ID: S-2
Lab ID: 1709340-02
Collection Date: 9/7/2017 03:33 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/13/17 15:45		Analyst: **RSH**
Mercury	ND		0.014	mg/Kg-dry	1	9/14/2017 12:30 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/11/17 11:54		Analyst: **RH**
Arsenic	**0.92**		**0.42**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Barium	**4.2**		**0.42**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Cadmium	ND		0.83	mg/Kg-dry	1	9/11/2017 07:38 PM
Chromium	**1.6**		**0.42**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Copper	**1.2**		**0.83**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Lead	**0.83**		**0.42**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Selenium	ND		0.83	mg/Kg-dry	1	9/11/2017 07:38 PM
Silver	ND		0.42	mg/Kg-dry	1	9/11/2017 07:38 PM
Zinc	**7.2**		**0.83**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
MOISTURE			**SW3550C**			Analyst: **BTG**
Moisture	**6.4**		**0.050**	**% of sample**	1	9/13/2017 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *18-Sep-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340
Sample ID: S-3
Lab ID: 1709340-03
Collection Date: 9/7/2017 03:37 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/13/17 15:45		Analyst: **RSH**
Mercury	ND		0.014	mg/Kg-dry	1	9/14/2017 12:32 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/11/17 11:54		Analyst: **RH**
Arsenic	**0.57**		**0.44**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Barium	**4.0**		**0.44**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Cadmium	ND		0.87	mg/Kg-dry	1	9/11/2017 07:44 PM
Chromium	**2.3**		**0.44**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Copper	**2.1**		**0.87**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Lead	**0.95**		**0.44**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Selenium	ND		0.87	mg/Kg-dry	1	9/11/2017 07:44 PM
Silver	ND		0.44	mg/Kg-dry	1	9/11/2017 07:44 PM
Zinc	**6.1**		**0.87**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**5.7**		**0.050**	**% of sample**	1	9/13/2017 06:20 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *18-Sep-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340
Sample ID: S-4
Lab ID: 1709340-04
Collection Date: 9/7/2017 03:39 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/13/17 15:45		Analyst: **RSH**
Mercury	ND		0.013	mg/Kg-dry	1	9/14/2017 12:35 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/11/17 11:54		Analyst: **RH**
Arsenic	**0.52**		**0.39**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
Barium	**3.6**		**0.39**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
Cadmium	ND		0.79	mg/Kg-dry	1	9/11/2017 08:16 PM
Chromium	**1.8**		**0.39**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
Copper	**0.91**		**0.79**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
Lead	**0.56**		**0.39**	**mg/Kg-dry**	1	9/14/2017 12:01 AM
Selenium	ND		0.79	mg/Kg-dry	1	9/11/2017 08:16 PM
Silver	ND		0.39	mg/Kg-dry	1	9/11/2017 08:16 PM
Zinc	**3.8**		**0.79**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**5.0**		**0.050**	**% of sample**	1	9/13/2017 06:20 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **107349** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-107349-107349**			Units: **mg/Kg**			Analysis Date: **9/14/2017 12:22 PM**			
Client ID:	Run ID: **HG1_170914A**			SeqNo: **4638765**			Prep Date: **9/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-107349-107349**			Units: **mg/Kg**			Analysis Date: **9/14/2017 12:25 PM**			
Client ID:	Run ID: **HG1_170914A**			SeqNo: **4638766**			Prep Date: **9/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1783	0.020	0.1665	0	107	80-120	0			

MS	Sample ID: **1709340-04AMS**			Units: **mg/Kg**			Analysis Date: **9/14/2017 12:37 PM**			
Client ID: **S-4**	Run ID: **HG1_170914A**			SeqNo: **4638771**			Prep Date: **9/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1481	0.017	0.1376	-0.0007473	108	75-125	0			

MSD	Sample ID: **1709340-04AMSD**			Units: **mg/Kg**			Analysis Date: **9/14/2017 12:40 PM**			
Client ID: **S-4**	Run ID: **HG1_170914A**			SeqNo: **4638772**			Prep Date: **9/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1436	0.016	0.1367	-0.0007473	106	75-125	0.1481	3.04	35	

The following samples were analyzed in this batch:

1709340-01A 1709340-02A 1709340-03A
1709340-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1709340
Project: Ryan Inc

QC BATCH REPORT

Batch ID: **107196** Instrument ID **ICP2** Method: **SW846 6010C**

MBLK Sample ID: **MBLK-107196-107196** Units: **mg/Kg** Analysis Date: **9/11/2017 04:12 PM**
Client ID: Run ID: **ICP2_170911A** SeqNo: **4633277** Prep Date: **9/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	0.03881	0.50								J
Chromium	0.03656	0.25								J
Copper	ND	0.50								
Lead	ND	0.25								
Selenium	ND	0.50								
Silver	ND	0.25								
Zinc	ND	0.50								

LCS Sample ID: **LCS-107196-107196** Units: **mg/Kg** Analysis Date: **9/11/2017 04:18 PM**
Client ID: Run ID: **ICP2_170911A** SeqNo: **4633278** Prep Date: **9/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.878	0.25	5	0	97.6	80-120	0			
Barium	5.004	0.25	5	0	100	80-120	0			
Cadmium	5.182	0.50	5	0	104	80-120	0			
Chromium	5.403	0.25	5	0	108	80-120	0			
Copper	4.986	0.50	5	0	99.7	80-120	0			
Lead	5.481	0.25	5	0	110	80-120	0			
Selenium	4.476	0.50	5	0	89.5	80-120	0			
Silver	4.973	0.25	5	0	99.5	80-120	0			
Zinc	5.134	0.50	5	0	103	80-120	0			

MS Sample ID: **1709279-01A MS** Units: **mg/Kg** Analysis Date: **9/11/2017 05:59 PM**
Client ID: Run ID: **ICP2_170911A** SeqNo: **4634382** Prep Date: **9/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.439	0.38	7.599	0.9889	98	75-125	0			
Barium	28.83	0.38	7.599	16.86	158	75-125	0			S
Cadmium	7.899	0.76	7.599	0.1561	102	75-125	0			
Chromium	11.38	0.38	7.599	2.338	119	75-125	0			
Copper	13.61	0.76	7.599	6.03	99.7	75-125	0			
Lead	11.79	0.38	7.599	5.349	84.8	75-125	0			
Selenium	7.939	0.76	7.599	1.274	87.7	75-125	0			
Silver	7.328	0.38	7.599	-0.02793	96.8	75-125	0			
Zinc	22.59	0.76	7.599	9.04	178	75-125	0			S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1709340
Project: Ryan Inc

QC BATCH REPORT

Batch ID: **107196** Instrument ID **ICP2** Method: **SW846 6010C**

MSD Sample ID: **1709279-01A MSD** Units: **mg/Kg** Analysis Date: **9/11/2017 06:05 PM**
Client ID: Run ID: **ICP2_170911A** SeqNo: **4634383** Prep Date: **9/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.904	0.38	7.599	0.9889	104	75-125	8.439	5.36	20	
Barium	29.87	0.38	7.599	16.86	171	75-125	28.83	3.53	20	S
Cadmium	8.432	0.76	7.599	0.1561	109	75-125	7.899	6.52	20	
Chromium	11.51	0.38	7.599	2.338	121	75-125	11.38	1.14	20	
Copper	11.58	0.76	7.599	6.03	73	75-125	13.61	16.1	20	S
Lead	11.95	0.38	7.599	5.349	86.9	75-125	11.79	1.36	20	
Selenium	8.662	0.76	7.599	1.274	97.2	75-125	7.939	8.71	20	
Silver	7.767	0.38	7.599	-0.02793	103	75-125	7.328	5.82	20	
Zinc	26.6	0.76	7.599	9.04	231	75-125	22.59	16.3	20	S

The following samples were analyzed in this batch: 1709340-01A 1709340-02A 1709340-03A 1709340-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1709340
Project: Ryan Inc

QC BATCH REPORT

Batch ID: **R219993** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R219993** Units: **% of sample** Analysis Date: **9/13/2017 03:00 PM**
Client ID: Run ID: **MOIST_170913C** SeqNo: **4638240** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R219993** Units: **% of sample** Analysis Date: **9/13/2017 03:00 PM**
Client ID: Run ID: **MOIST_170913C** SeqNo: **4638239** 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: **1709095-03A DUP** Units: **% of sample** Analysis Date: **9/13/2017 03:00 PM**
Client ID: Run ID: **MOIST_170913C** SeqNo: **4638234** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	25.02	0.050	0	0	0	0-0	23.05	8.2	5	R

DUP Sample ID: **1709325-02A DUP** Units: **% of sample** Analysis Date: **9/13/2017 03:00 PM**
Client ID: Run ID: **MOIST_170913C** SeqNo: **4638236** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	22.11	0.050	0	0	0	0-0	22.9	3.51	5	

The following samples were analyzed in this batch: 1709340-01A 1709340-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1709340
Project: Ryan Inc

QC BATCH REPORT

Batch ID: **R219996** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R219996** Units: **% of sample** Analysis Date: **9/13/2017 06:20 PM**
Client ID: Run ID: **MOIST_170913D** SeqNo: **4638312** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R219996** Units: **% of sample** Analysis Date: **9/13/2017 06:20 PM**
Client ID: Run ID: **MOIST_170913D** SeqNo: **4638311** 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: **1709371-03A DUP** Units: **% of sample** Analysis Date: **9/13/2017 06:20 PM**
Client ID: Run ID: **MOIST_170913D** SeqNo: **4638292** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.35	0.050	0	0	0	0-0	18.58	6.85	5	R

DUP Sample ID: **1709371-07A DUP** Units: **% of sample** Analysis Date: **9/13/2017 06:20 PM**
Client ID: Run ID: **MOIST_170913D** SeqNo: **4638297** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	30.94	0.050	0	0	0	0-0	31.16	0.709	5	

The following samples were analyzed in this batch: 1709340-03A 1709340-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

ALS Environmental

Page ____ of ____

COC ID: 38942

ALS Project Manager: | ALS Work Order #: 1709340

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Ryan Inc	A	MI 10 Metals
Work Order		Project Number	032-17-001	B	
Company Name	Engineering & Environmental Solutions	Bill To Company	Engineering & Environmental Solutions	C	
Send Report To	Blaine Litteral	Invoice Attn		D	
Address	400 136th Ave Bldg 100, Suite B	Address	400 136th Ave Bldg 100, Suite B	E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip	Holland, MI 49424	G	
Phone	(616) 931-3967	Phone	(616) 931-3967	H	
Fax	(616) 931-3970	Fax	(616) 931-3970	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	S-1	9/7	3:31	Sand		1	X										
2	S-2	9/7	3:33	Sand		1	X										
3	S-3	9/7	3:37	Sand		1	X										
4	S-4	9/7	3:39	Sand		1	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Mitchell Stark

Shipment Method:

Turnaround Time in Business Days (BD): ☒ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other

Results Due Date:

Relinquished by:	Date: 9/7	Time: 4:07	Received by:	Notes:	
Relinquished by:	Date:	Time:	Received by (Laboratory): 4:07pm 9-7-17	Cooler ID: SR2	Cooler Temp: 5.6°C
Logged by (Laboratory): DES	Date: 9/7/17	Time: 1620	Checked by (Laboratory):		

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **07-Sep-17 16:07**

Work Order: **1709340** Received by: **SA**

Checklist completed by Diane Shaw (eSignature) 07-Sep-17 (Date) Reviewed by: Bill Carey (eSignature) 08-Sep-17 (Date)

Matrices: Soil
Carrier name: Client

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):	5.6/5.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	9/7/2017 4:23:07 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:

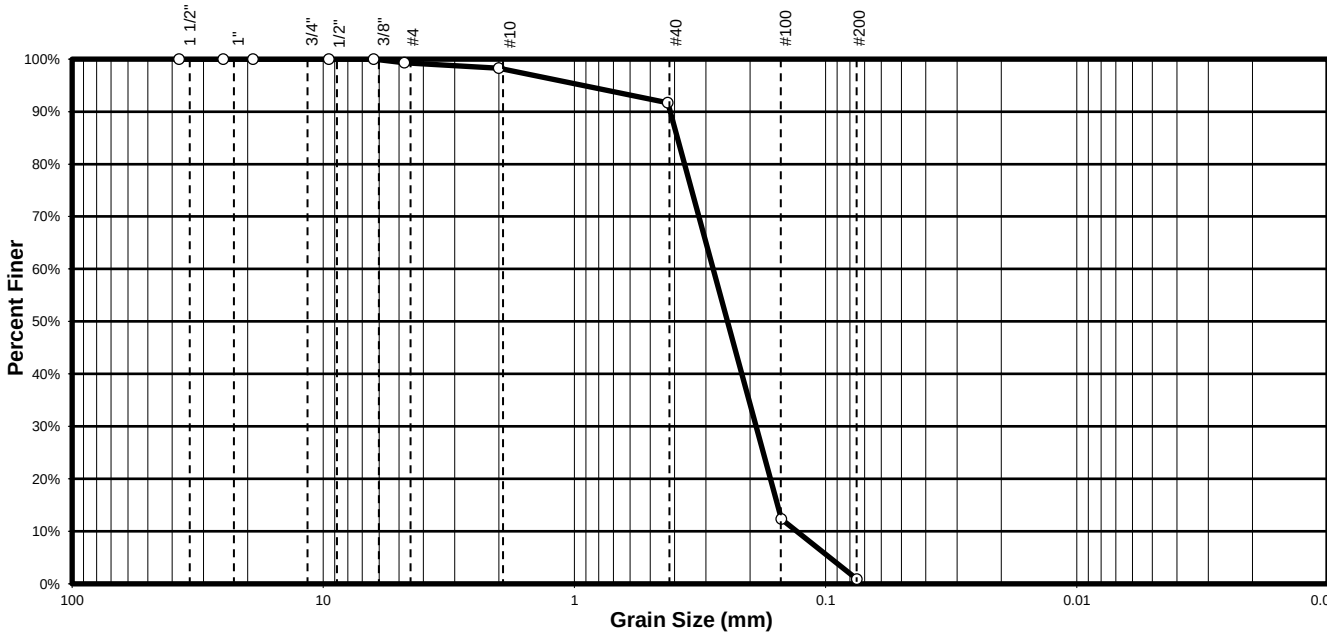
Comments:

CorrectiveAction:

APPENDIX C.1.2

FINAL CONFORMANCE FILL TEST RESULTS

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	6.6	90.9	0.8	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	100.0%		
1/4"	100.0%		
#4	99.3%		
#10	98.3%		
#40	91.7%		
#100	12.3%		
#200	0.9%		

Material Description

Brown medium to fine SAND

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.13 Cc= 2.154

D_{30}= 0.19 Cu= 0.078

D_{60}= 0.28

Classification

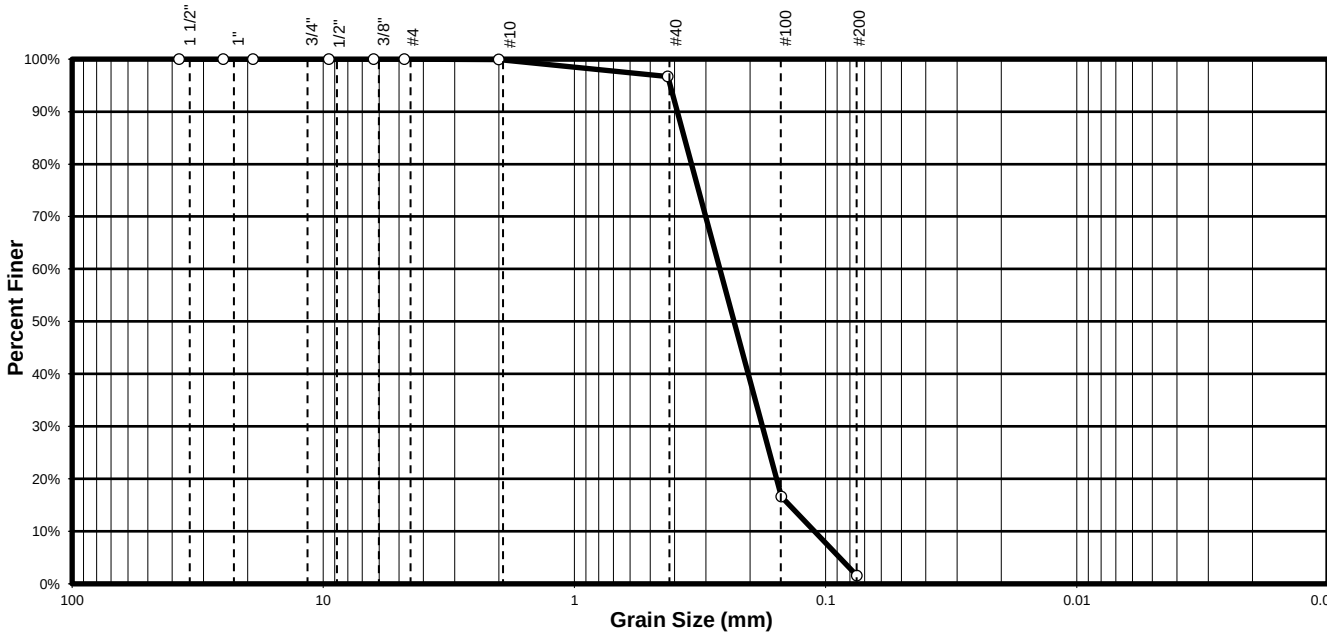
SP, Poorly Graded sand

Remarks

Sample ID:	Sample #3	Client:	Holland BPW
Lab ID:	17-001	Project:	James DeYoung CYAP

Engineering &

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	3.2	95.6	1.1	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	100.0%		
1/4"	100.0%		
#4	100.0%		
#10	99.9%		
#40	96.7%		
#100	16.6%		
#200	1.5%		

Material Description

Brown medium to fine SAND

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.12 Cc= 3

D_{30}= 0.18 Cu= 0.097

D_{60}= 0.36

Classification

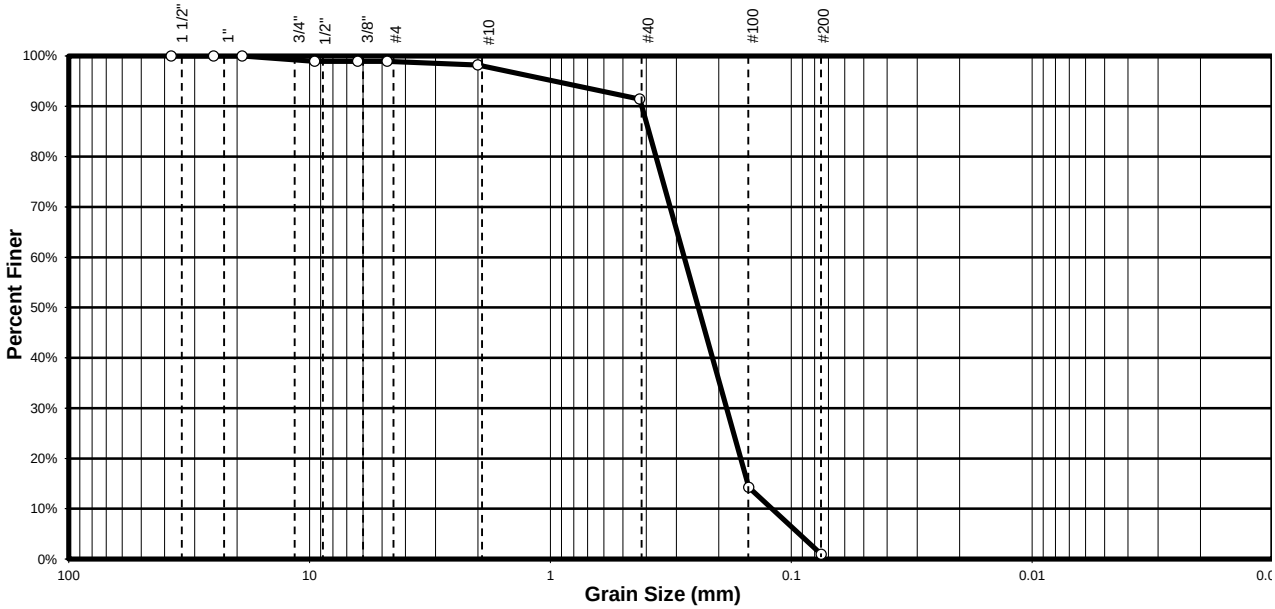
SP, Poorly Graded Sand

Remarks

Sample ID:	Sample #4	Client:	Holland BPW
Lab ID:	17-002	Project:	James DeYoung CYAP

Engineering &

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	6.8	90.5	0.9	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	98.9%		
1/4"	98.9%		
#4	98.9%		
#10	98.2%		
#40	91.4%		
#100	14.3%		
#200	0.9%		

Material Description

Brown medium to fine SAND

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.13 Cc= 2.154

D_{30}= 0.18 Cu= 0.07

D_{60}= 0.28

Classification

SP, Poorly Graded Sand

Remarks

Sample ID:	Leachate Sand	Client:	Holland BPW
Lab ID:	LS-13	Project:	James DeYoung CYAP
	Engineering & Environmental Solutions, LLC	Project Number:	133-17-001

DRIESENGA & ASSOCIATES, INC.
Engineering · Surveying · Testing

12330 James Street, Suite H80
Holland, Michigan 49424
Ph. (616) 396-0255 • Fax (616) 396-0100
www.driesenga.com

Maximum Dry Density/Optimum Moisture Determination
ASTM Method D1557

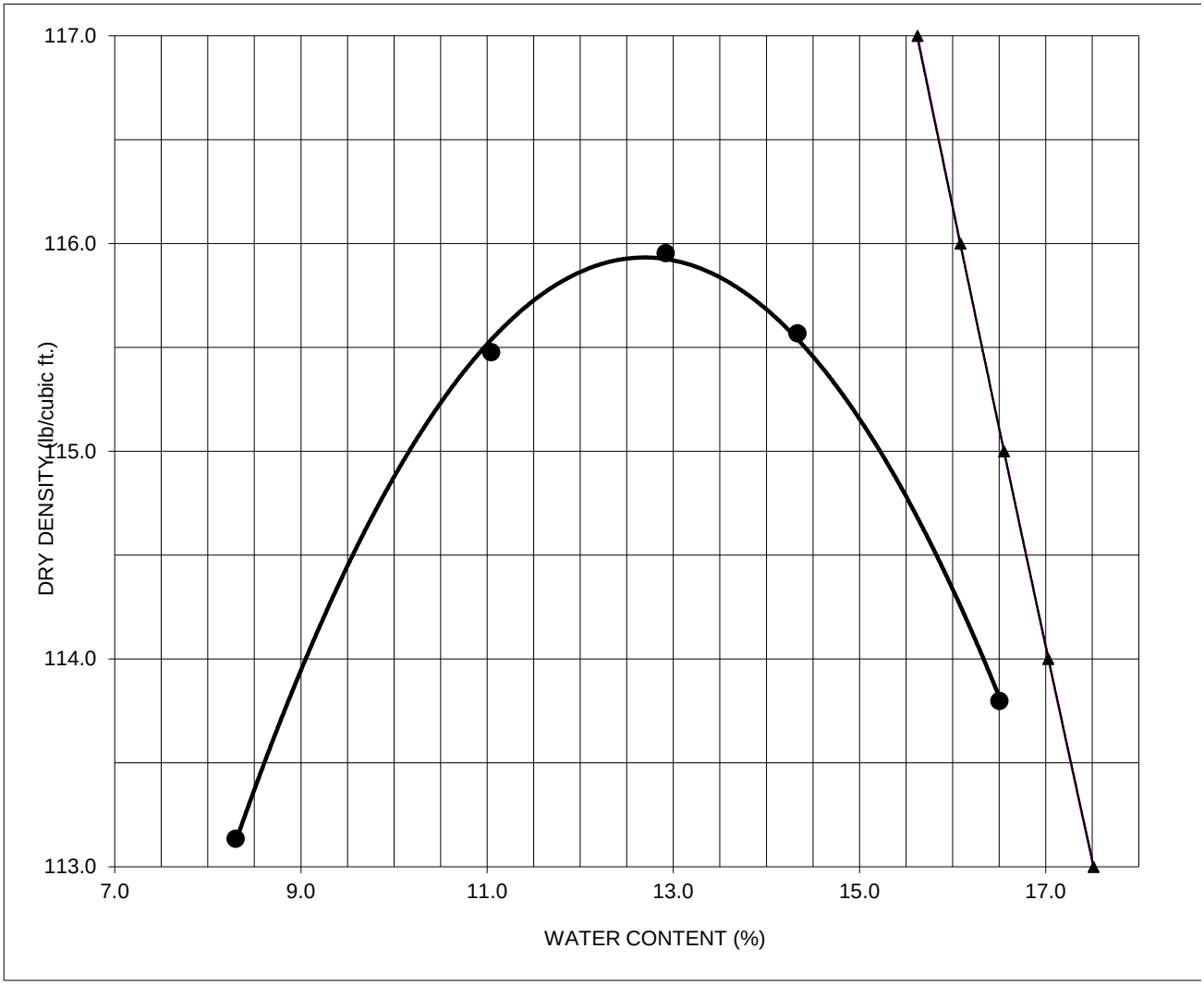
Project Name: Holland BPW - 133-17-001

Date of Test: 12/1/2017 Project Number: 1710797.4A

Sample Description: Light Brown Fine to Medium Sand, Trace Gravel

Sampled By: Client Tested in Lab By: Scott Cathey

Specific Gravity of Soil (Gs): 2.65 (assumed)



n Laboratory Test Data t 100% Saturation Line

Maximum Dry Density: **116.0 PCF** Optimum Moisture Content: **13.0%**

ASTM Method: Procedure A, Moist Preparation Method, Manual Rammer

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Maximum Dry Density/Optimum Moisture Determination
ASTM Method D1557

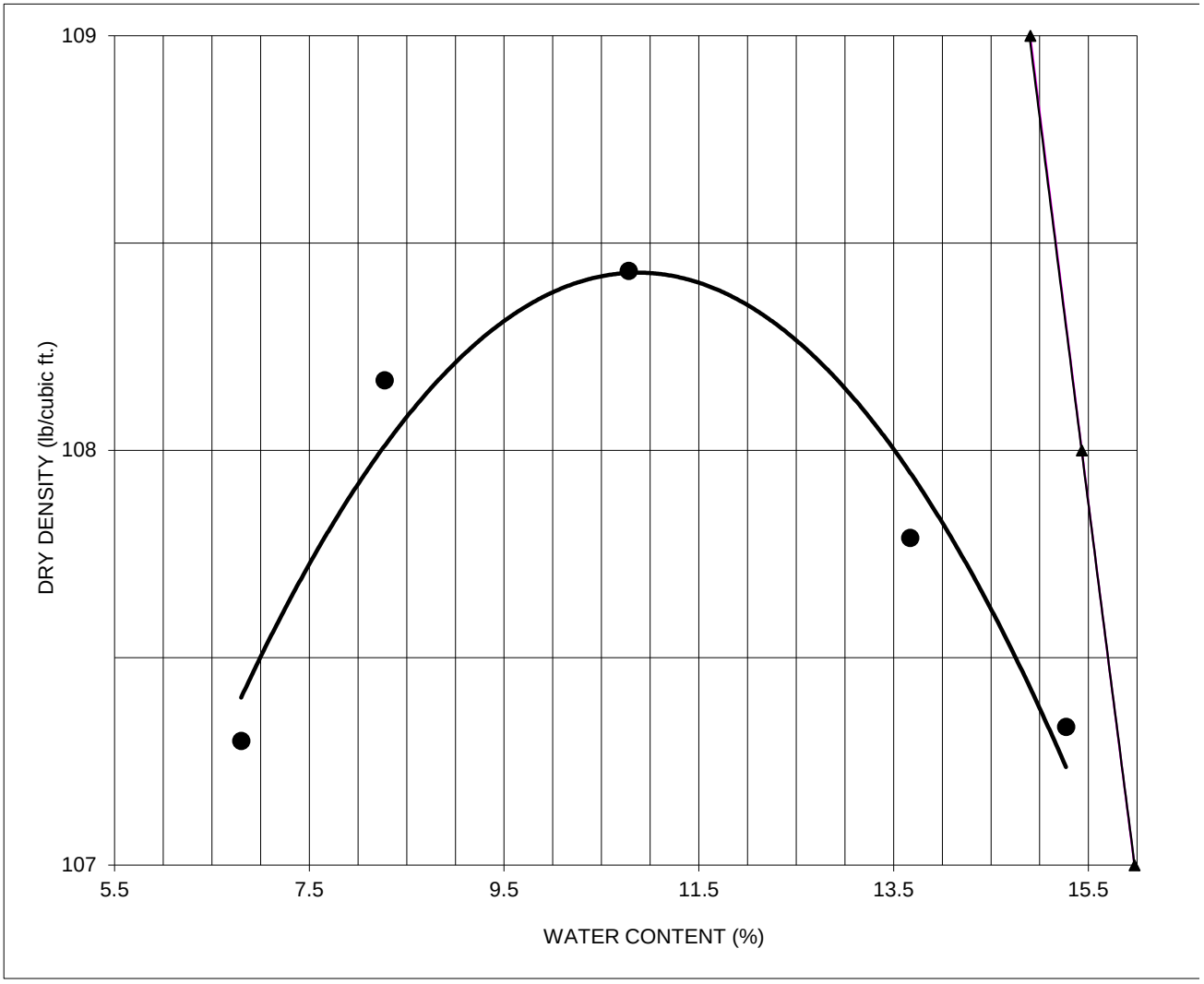
Project Name: Holland BPW - 133-17-001

Date of Test: 12/4/2017 Project Number: 1710797.4A

Sample Description: Brown Fine to Medium Sand, Trace Silt

Sampled By: Client Tested in Lab By: Josh Hunsaker

Specific Gravity of Soil (Gs): 2.36 (assumed)



n Laboratory Test Data t 100% Saturation Line

Maximum Dry Density: **108.5 PCF** Optimum Moisture Content: **11.0%**

ASTM Method: Procedure A, Moist Preparation Method, Manual Rammer

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Maximum Dry Density/Optimum Moisture Determination
ASTM Method D1557

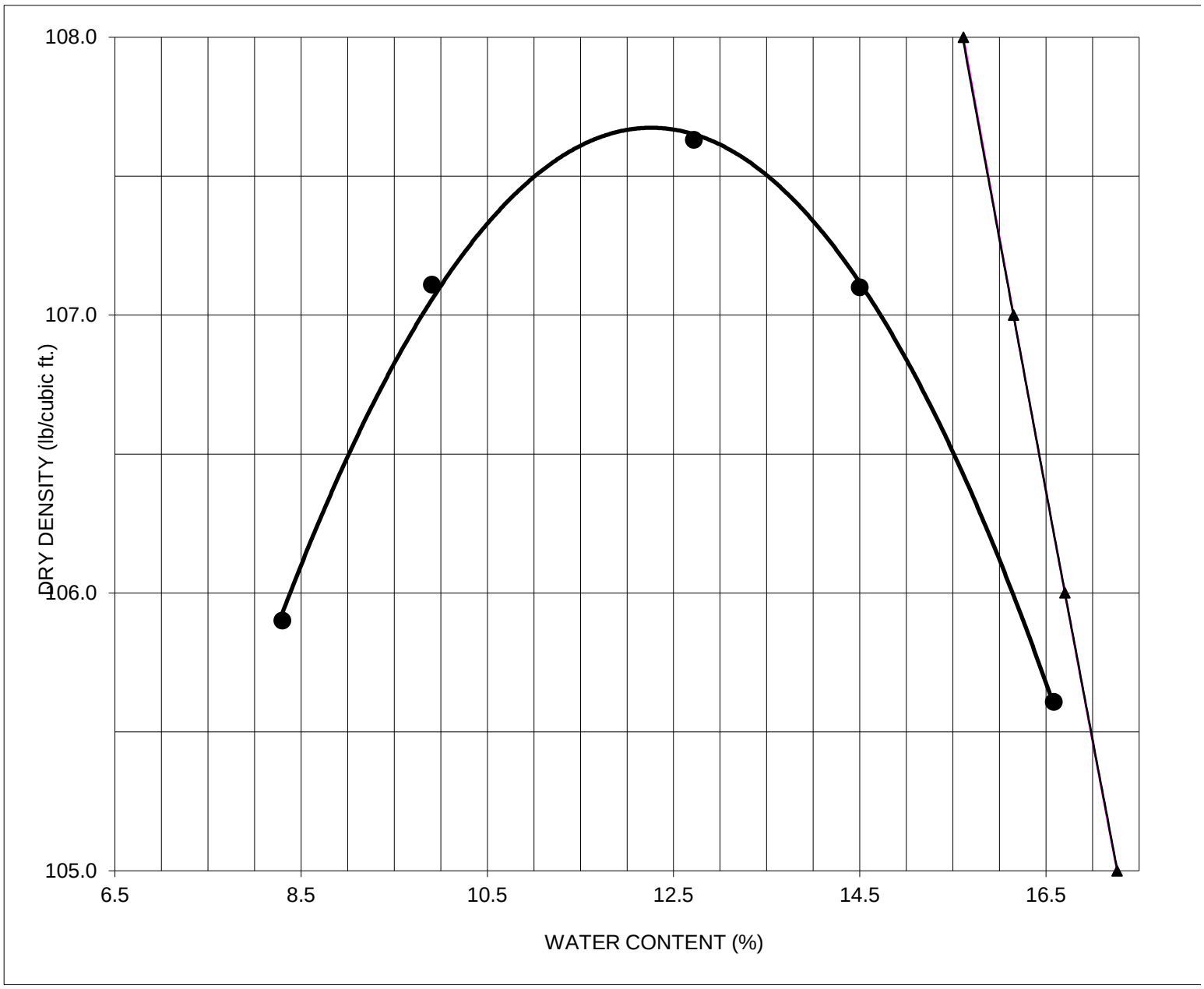
Project Name: Holland BPW - 133-17-001

Date of Test: 4/4/2018 Project Number: 1710797.4A

Sample Description: Brown Fine to Medium Sand, Trace Silt

Sampled By: Client Tested in Lab By: Jake Stocking

Specific Gravity of Soil (Gs): 2.37 (assumed)



n Laboratory Test Data t 100% Saturation Line

Maximum Dry Density: **107.5 PCF** Optimum Moisture Content: **12.5%**

ASTM Method: Procedure A, Moist Preparation Method, Manual Rammer

APPENDIX C.1.3

FIELD DENSITY TESTING RESULTS

Engineering & Environmental Solutions, LLC

www.goEEsolutions.net

Moisture and Density Log

12/7/2017

Project: JDY Coal Yard Closure Project No: 133-17-001

Field Tech: Mitchell Stark

Weather: Snowy
26
Precipitation: none

	Standard Counts	
	Density	Moisture
Reference	1585	628
Daily	1578	609

Area Tested: Berm

Soil Type: Silty with small amount of clay

Gauge No:

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	6"	1	1	119.3	99.7	19.5	108.5	11	19.7	91.9		
2	6"	2	1	124.3	104.1	20.1	108.5	11	19.4	95.9		
3	6"	3	1	119.4	96.9	23.4	108.5	11	23.2	89.3		
4	6"	4	1	112.7	96.8	15.9	108.5	11	16.4	89.2		
5	6"	5	1	120.7	104.4	16.3	108.5	11	15.6	96.2		
6	6"	6	1	118.4	102.3	16	108.5	11	15.7	94.3		
7	6"	7	1	121.1	103.5	17.6	108.5	11	17.0	95.4		
8	6"	8	1	123.4	105.2	18.2	108.5	11	17.3	97.0		
9	6"	9	1	122.8	102.6	20.2	108.5	11	19.7	94.6		
10	6"	10	1	123.3	105.6	17.7	108.5	11	16.8	97.3		
11	6"	11	1	119.1	102.9	16.1	108.5	11	15.7	94.8		
12	6"	12	1	120.8	103.4	17.3	108.5	11	16.8	95.3		
13	6"	13	1	124	107.4	16.6	108.5	11	15.5	99.0		
14	6"	14	1	110.1	92.8	17.3	108.5	11	18.6	85.5		Retested on 5-4-2018 as Test No. 1
15	6"	15	1	114.6	93.1	21.4	108.5	11	23.1	85.8		Retested on 5-4-2018 as Test No. 2
16	6"	16	1	122.5	106.1	16.4	108.5	11	15.5	97.8		
17	6"	17	1	118.8	102.8	16	108.5	11	15.6	94.7		
18	6"	18	1	115.4	99.7	15.7	108.5	11	15.7	91.9		

Notes:

Mitchell Stark

Field Tech _____

Engineering & Environmental Solutions, LLC
www.goEEsolutions.net

Moisture and Density Log

Date: 5-4-18

Project: JDY Coal Yard Closure Project No: 133-17-001
Field Tech: Amy Mandrell

Weather: Windy	
Temperature: 60	
Precipitation: Rain	

Standard Counts

	Density	Moisture
Reference	1706	652
Daily	1693	644

Area Tested: Ponds & graded coal/CCR area
Soil Type: Sand & Topsoil
Gauge No: 3440

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	6"	1	1	109.4	103.1	6.2	107.5	12.5	6.0	96.0		Retest of Test No. 14 12-7-2017
2	6"	2	1	123	106.9	16.1	107.5	12.5	15.1	99.4		Retest of Test No. 15 12-7-2017
3	12"	3	1	122.9	102.7	20.2	107.5	12.5	19.7	95.5		
4	6"	4	1	121.7	101.5	20.1	107.5	12.5	19.8	94.4		
5	6"	5	1	114.4	97.2	17.2	107.5	12.5	17.7	90.4		
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												

Notes:

Amy Mandrell
Field Tech _____

APPENDIX C.2

TOPSOIL TEST RESULTS

Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B, Holland, Michigan 49424

Memorandum

To Jane Monroe

Company Holland BPW

From Blaine Litteral, P.E. *Project Number* 133-17-001

Date October 25, 2017

Re: Top Soil for James DeYoung Coal Yard

Jane:

Two stockpiles of top soil that are proposed to be utilized for the Holland BPW James DeYoung coal yard project were sampled for Michigan 10 metals, pH, and organic matter on September 18, 2017. The samples were collected and analyzed on behalf of Ryan Incorporated and the laboratory results compared to Part 201 Generic Cleanup Criteria to obtain approval for use at the site. Copies of the laboratory results are attached.

Top soil samples TS-1 through TS-5 were collected from the sand mining operation located on Perry Street approximately a quarter mile east of 40th Avenue, in southeastern Ottawa County, Michigan. Samples TS-1 through TS-4 were found to be below the Statewide Default Background Levels Criteria with the exception of Selenium. Selenium was below the applicable GSI criteria for the site. The pH and percent organic matter for sample TS-5 met the requirements in Section 02925 of the Construction Documents. Therefore topsoil material from the Perry Street stockpiles are approved for use at the site.

Top soil samples TS-6 through TS-10 were collected from Brewer's Ready Mix Plant at 3246 80th Avenue in Zeeland, MI. The laboratory results were compared to Part 201 Generic Cleanup Criteria. Samples TS-6 through TS-9 were not found to be below the Statewide Default Background Levels Criteria. Sample TS-10 did not meet the pH requirement in Section 02925 of the Construction Documents. Therefore the material from the 80th Avenue stockpiles is not to be used in the constructions.

If you have any questions, please call me at 616-994-6541 or email me a blaine.litteral@goeesolutions.net.

Blaine A. Litteral, P.E.
Certifying Engineer

ALS Environmental

24-Oct-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **Ryan Inc HBPW**

Work Order: **1709984**

Dear Blaine,

Revision: **1**

ALS Environmental received 10 samples on 18-Sep-2017 03:30 PM 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 industry accepted practices and Quality Control 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 25.

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

Report of Laboratory Analysis

ALS Group, USA

Date: 24-Oct-17

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1709984-01	TS-1	Soil		9/18/2017 02:05	9/18/2017 15:30	☐
1709984-02	TS-2	Soil		9/18/2017 02:06	9/18/2017 15:30	☐
1709984-03	TS-3	Soil		9/18/2017 02:06	9/18/2017 15:30	☐
1709984-04	TS-4	Soil		9/18/2017 02:07	9/18/2017 15:30	☐
1709984-05	TS-5	Soil		9/18/2017 02:08	9/18/2017 15:30	☐
1709984-06	TS-6	Soil		9/18/2017 02:27	9/18/2017 15:30	☐
1709984-07	TS-7	Soil		9/18/2017 02:28	9/18/2017 15:30	☐
1709984-08	TS-8	Soil		9/18/2017 02:30	9/18/2017 15:30	☐
1709984-09	TS-9	Soil		9/18/2017 02:31	9/18/2017 15:30	☐
1709984-10	TS-10	Soil		9/18/2017 02:32	9/18/2017 15:30	☐

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
WorkOrder: 1709984

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
%	Percent
% of sample	Percent of Sample
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
s.u.	Standard Units

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984
Sample ID: TS-1
Lab ID: 1709984-01
Collection Date: 9/18/2017 02:05 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.044**		**0.015**	**mg/Kg-dry**	1	9/28/2017 05:00 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/22/17 14:57		Analyst: **HBA**
Arsenic	**5.1**		**0.42**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Barium	**43**		**0.42**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Cadmium	ND		0.85	mg/Kg-dry	1	9/28/2017 12:49 AM
Chromium	**9.3**		**0.42**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Copper	**13**		**0.85**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Lead	**18**		**0.42**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Selenium	**1.7**		**0.85**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Silver	ND		0.42	mg/Kg-dry	1	9/28/2017 12:49 AM
Zinc	**40**		**0.85**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**11**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW **Work Order:** 1709984
Sample ID: TS-2 **Lab ID:** 1709984-02
Collection Date: 9/18/2017 02:06 AM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.042**		**0.013**	**mg/Kg-dry**	1	9/28/2017 05:03 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/22/17 14:57		Analyst: **HBA**
Arsenic	**4.8**		**0.36**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Barium	**40**		**0.36**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Cadmium	ND		0.72	mg/Kg-dry	1	9/28/2017 12:55 AM
Chromium	**9.0**		**0.36**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Copper	**12**		**0.72**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Lead	**17**		**0.36**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Selenium	**1.6**		**0.72**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Silver	ND		0.36	mg/Kg-dry	1	9/28/2017 12:55 AM
Zinc	**37**		**0.72**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**8.1**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-3
Collection Date: 9/18/2017 02:06 AM

Work Order: 1709984
Lab ID: 1709984-03
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.033**		**0.014**	**mg/Kg-dry**	1	9/28/2017 05:06 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/22/17 14:57		Analyst: **HBA**
Arsenic	**4.3**		**0.44**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Barium	**41**		**0.44**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Cadmium	ND		0.88	mg/Kg-dry	1	9/28/2017 01:01 AM
Chromium	**9.1**		**0.44**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Copper	**13**		**0.88**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Lead	**17**		**0.44**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Selenium	**1.8**		**0.88**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Silver	ND		0.44	mg/Kg-dry	1	9/28/2017 01:01 AM
Zinc	**36**		**0.88**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 10/20/17 13:22		Analyst: **JF**
Selenium	ND		0.0050	mg/L	1	10/20/2017 06:21 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**11**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984
Sample ID: TS-4
Lab ID: 1709984-04
Collection Date: 9/18/2017 02:07 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.040**		**0.015**	**mg/Kg-dry**	1	9/28/2017 05:08 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**4.6**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Barium	**40**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Cadmium	ND		0.77	mg/Kg-dry	1	9/28/2017 02:24 AM
Chromium	**8.9**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Copper	**12**		**0.77**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Lead	**17**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Selenium	**1.7**		**0.77**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Silver	ND		0.39	mg/Kg-dry	1	9/28/2017 02:24 AM
Zinc	**39**		**0.77**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.9**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-5
Collection Date: 9/18/2017 02:08 AM

Work Order: 1709984
Lab ID: 1709984-05
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE, ASH, AND ORGANIC MATTER			**D2974-00**			Analyst: **NW**
Moisture Content - Method A (105 °C)	11		0.025	%	1	9/30/2017 12:20 PM
Ash Content - Method C (440 °C)	96		0.025	%	1	9/30/2017 12:20 PM
Organic Matter	3.8		0.025	%	1	9/30/2017 12:20 PM
PH			**SW9045D**		Prep: EXTRACT 9/19/17 18:20	Analyst: **JB**
pH	7.50		0.100	s.u.	1	9/21/2017 10:50 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984
Sample ID: TS-6
Lab ID: 1709984-06
Collection Date: 9/18/2017 02:27 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.021**		**0.014**	**mg/Kg-dry**	1	9/28/2017 05:11 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**3.5**		**0.44**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Barium	**28**		**0.44**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Cadmium	ND		0.87	mg/Kg-dry	1	9/28/2017 02:31 AM
Chromium	**6.0**		**0.44**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Copper	**5.6**		**0.87**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Lead	**13**		**0.44**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Selenium	**1.5**		**0.87**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Silver	ND		0.44	mg/Kg-dry	1	9/28/2017 02:31 AM
Zinc	**25**		**0.87**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.0**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-7
Collection Date: 9/18/2017 02:28 AM

Work Order: 1709984
Lab ID: 1709984-07
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.023**		**0.014**	**mg/Kg-dry**	1	9/28/2017 05:13 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**6.4**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Barium	**35**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Cadmium	ND		0.78	mg/Kg-dry	1	9/28/2017 02:37 AM
Chromium	**8.1**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Copper	**8.8**		**0.78**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Lead	**22**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Selenium	**1.5**		**0.78**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Silver	ND		0.39	mg/Kg-dry	1	9/28/2017 02:37 AM
Zinc	**34**		**0.78**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.3**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-8
Collection Date: 9/18/2017 02:30 AM

Work Order: 1709984
Lab ID: 1709984-08
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.018**		**0.014**	**mg/Kg-dry**	1	9/28/2017 05:29 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**4.1**		**0.35**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Barium	**36**		**0.35**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Cadmium	ND		0.71	mg/Kg-dry	1	9/28/2017 02:43 AM
Chromium	**8.9**		**0.35**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Copper	**8.2**		**0.71**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Lead	**22**		**0.35**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Selenium	**1.5**		**0.71**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Silver	ND		0.35	mg/Kg-dry	1	9/28/2017 02:43 AM
Zinc	**36**		**0.71**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.3**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984
Sample ID: TS-9
Lab ID: 1709984-09
Collection Date: 9/18/2017 02:31 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.020**		**0.015**	**mg/Kg-dry**	1	9/28/2017 05:31 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**4.4**		**0.38**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Barium	**39**		**0.38**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Cadmium	ND		0.76	mg/Kg-dry	1	9/28/2017 02:49 AM
Chromium	**11**		**0.38**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Copper	**9.4**		**0.76**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Lead	**27**		**0.38**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Selenium	**1.6**		**0.76**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Silver	ND		0.38	mg/Kg-dry	1	9/28/2017 02:49 AM
Zinc	**43**		**0.76**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.5**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-10
Collection Date: 9/18/2017 02:32 AM

Work Order: 1709984
Lab ID: 1709984-10
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor		Date Analyzed
MOISTURE, ASH, AND ORGANIC MATTER			**D2974-00**				Analyst: **NW**
Moisture Content - Method A (105 °C)	9.0		0.025	%	1		9/30/2017 12:20 PM
Ash Content - Method C (440 °C)	96		0.025	%	1		9/30/2017 12:20 PM
Organic Matter	3.6		0.025	%	1		9/30/2017 12:20 PM
PH			**SW9045D**		Prep: EXTRACT	9/19/17 18:20	Analyst: **JB**
pH	7.55		0.100	s.u.	1		9/21/2017 10:50 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: I

ALS Group, USA

Date: 24-Oct-17

Client: Engineering & Environmental Solutions

Work Order: 1709984

Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **108121** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-108121-108121** Units: **mg/Kg** Analysis Date: **9/28/2017 04:20 PM**

Client ID: Run ID: **HG1_170928A** SeqNo: **4667300** Prep Date: **9/28/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-108121-108121** Units: **mg/Kg** Analysis Date: **9/28/2017 04:22 PM**

Client ID: Run ID: **HG1_170928A** SeqNo: **4667301** Prep Date: **9/28/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1558	0.020	0.1665	0	93.6	80-120	0			

MS Sample ID: **1709984-07AMS** Units: **mg/Kg** Analysis Date: **9/28/2017 05:16 PM**

Client ID: **TS-7** Run ID: **HG1_170928A** SeqNo: **4667347** Prep Date: **9/28/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1412	0.017	0.1376	0.0206	87.6	75-125	0			

MSD Sample ID: **1709984-07AMSD** Units: **mg/Kg** Analysis Date: **9/28/2017 05:26 PM**

Client ID: **TS-7** Run ID: **HG1_170928A** SeqNo: **4667356** Prep Date: **9/28/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1466	0.017	0.1395	0.0206	90.3	75-125	0.1412	3.8	35	

The following samples were analyzed in this batch:

1709984-01A	1709984-02A	1709984-03A
1709984-04A	1709984-06A	1709984-07A
1709984-08A	1709984-09A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **107822** Instrument ID **ICP2** Method: **SW846 6010C**

MBLK Sample ID: **MBLK-107822-107822** Units: **mg/Kg** Analysis Date: **9/27/2017 09:50 PM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662613** Prep Date: **9/22/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	0.167	0.50								J
Chromium	0.0905	0.25								J
Copper	ND	0.50								
Lead	ND	0.25								
Selenium	ND	0.50								
Silver	ND	0.25								
Zinc	ND	0.50								

LCS Sample ID: **LCS-107822-107822** Units: **mg/Kg** Analysis Date: **9/27/2017 09:56 PM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662614** Prep Date: **9/22/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.07	0.25	5	0	101	80-120	0			
Barium	5.503	0.25	5	0	110	80-120	0			
Cadmium	5.414	0.50	5	0	108	80-120	0			
Chromium	5.942	0.25	5	0	119	80-120	0			
Copper	5.441	0.50	5	0	109	80-120	0			
Lead	5.558	0.25	5	0	111	80-120	0			
Selenium	4.97	0.50	5	0	99.4	80-120	0			
Silver	5.555	0.25	5	0	111	80-120	0			
Zinc	5.348	0.50	5	0	107	80-120	0			

MS Sample ID: **17091277-01AMS** Units: **mg/Kg** Analysis Date: **9/27/2017 10:16 PM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662617** Prep Date: **9/22/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	18.84	0.33	6.693	9.011	147	75-125	0			S
Barium	374.3	0.33	6.693	362.6	174	75-125	0			SO
Cadmium	9.104	0.67	6.693	0.9035	123	75-125	0			
Chromium	22.09	0.33	6.693	10.13	179	75-125	0			S
Copper	27	0.67	6.693	18.28	130	75-125	0			S
Lead	23.1	0.33	6.693	13.89	138	75-125	0			S
Selenium	8.64	0.67	6.693	1.729	103	75-125	0			
Silver	7.716	0.33	6.693	-0.2624	119	75-125	0			
Zinc	84.66	0.67	6.693	74.71	149	75-125	0			SO

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **107822** Instrument ID **ICP2** Method: **SW846 6010C**

MSD Sample ID: **17091277-01AMSD** Units: **mg/Kg** Analysis Date: **9/27/2017 10:23 PM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662618** Prep Date: **9/22/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	16.93	0.34	6.729	9.011	118	75-125	18.84	10.7	20	
Barium	439	0.34	6.729	362.6	1130	75-125	374.3	15.9	20	SO
Cadmium	8.965	0.67	6.729	0.9035	120	75-125	9.104	1.54	20	
Chromium	20.62	0.34	6.729	10.13	156	75-125	22.09	6.84	20	S
Copper	24.14	0.67	6.729	18.28	87	75-125	27	11.2	20	
Lead	21.88	0.34	6.729	13.89	119	75-125	23.1	5.41	20	
Selenium	8.909	0.67	6.729	1.729	107	75-125	8.64	3.07	20	
Silver	7.766	0.34	6.729	-0.2624	119	75-125	7.716	0.642	20	
Zinc	86.21	0.67	6.729	74.71	171	75-125	84.66	1.82	20	SO

The following samples were analyzed in this batch: 1709984-01A 1709984-02A 1709984-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Batch ID: **107894** Instrument ID **ICP2** Method: **SW846 6010C**

MBLK Sample ID: **MBLK-107894-107894** Units: **mg/Kg** Analysis Date: **9/25/2017 03:58 PM**
Client ID: Run ID: **ICP2_170925A** SeqNo: **4656593** Prep Date: **9/25/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	0.0635	0.50								J
Chromium	0.073	0.25								J
Copper	ND	0.50								
Lead	ND	0.25								
Selenium	ND	0.50								
Silver	ND	0.25								
Zinc	0.1035	0.50								J

LCS Sample ID: **LCS-107894-107894** Units: **mg/Kg** Analysis Date: **9/25/2017 04:04 PM**
Client ID: Run ID: **ICP2_170925A** SeqNo: **4656594** Prep Date: **9/25/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.7	0.25	5	0	94	80-120	0			
Barium	4.935	0.25	5	0	98.7	80-120	0			
Cadmium	5.113	0.50	5	0	102	80-120	0			
Chromium	5.402	0.25	5	0	108	80-120	0			
Copper	5.044	0.50	5	0	101	80-120	0			
Lead	5.257	0.25	5	0	105	80-120	0			
Selenium	4.43	0.50	5	0	88.6	80-120	0			
Silver	4.94	0.25	5	0	98.8	80-120	0			
Zinc	5.834	0.50	5	0	117	80-120	0			

MS Sample ID: **17091287-03AMS** Units: **mg/Kg** Analysis Date: **9/25/2017 04:46 PM**
Client ID: Run ID: **ICP2_170925A** SeqNo: **4656599** Prep Date: **9/25/2017** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	13.11	3.2	6.46	5.676	115	75-125	0			
Barium	66.39	3.2	6.46	63.6	43.3	75-125	0			SO
Cadmium	14.15	6.5	6.46	6.508	118	75-125	0			
Chromium	337.1	3.2	6.46	360.7	-364	75-125	0			SO
Copper	175.2	6.5	6.46	194.7	-302	75-125	0			SO
Lead	473.9	3.2	6.46	449.2	383	75-125	0			SO
Selenium	315.3	6.5	6.46	299.4	247	75-125	0			SO
Silver	13.57	3.2	6.46	6.959	102	75-125	0			
Zinc	14470	6.5	6.46	14160	4850	75-125	0			SEO

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **107894** Instrument ID **ICP2** Method: **SW846 6010C**

MS Sample ID: **17091287-03AMS** Units: **mg/Kg** Analysis Date: **9/28/2017 01:20 AM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662645** Prep Date: **9/25/2017** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Zinc	17080	65	6.46	15560	23600	75-125	0			SO

MSD Sample ID: **17091287-03AMSD** Units: **mg/Kg** Analysis Date: **9/25/2017 04:52 PM**
Client ID: Run ID: **ICP2_170925A** SeqNo: **4656600** Prep Date: **9/25/2017** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.92	3.2	6.443	5.676	96.9	75-125	13.11	9.54	20	
Barium	62.89	3.2	6.443	63.6	-11	75-125	66.39	5.42	20	SO
Cadmium	13.6	6.4	6.443	6.508	110	75-125	14.15	3.98	20	
Chromium	296.4	3.2	6.443	360.7	-998	75-125	337.1	12.9	20	SO
Copper	184.5	6.4	6.443	194.7	-159	75-125	175.2	5.13	20	SO
Lead	466.2	3.2	6.443	449.2	265	75-125	473.9	1.63	20	SO
Selenium	303.4	6.4	6.443	299.4	62.7	75-125	315.3	3.84	20	SO
Silver	12.56	3.2	6.443	6.959	87	75-125	13.57	7.67	20	
Zinc	14170	6.4	6.443	14160	168	75-125	14470	2.11	20	SEO

MSD Sample ID: **17091287-03AMSD** Units: **mg/Kg** Analysis Date: **9/28/2017 01:26 AM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662646** Prep Date: **9/25/2017** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Zinc	16270	64	6.443	15560	11100	75-125	17080	4.84	20	SO

The following samples were analyzed in this batch:

1709984-04A	1709984-06A	1709984-07A
1709984-08A	1709984-09A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **109344** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-109344-109344** Units: **mg/L** Analysis Date: **10/20/2017 06:14 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714279** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	ND	0.0050								

LCS Sample ID: **LCS-109344-109344** Units: **mg/L** Analysis Date: **10/20/2017 06:20 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714283** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.09687	0.0050	0.1	0	96.9	80-120	0			

MS Sample ID: **17101137-01AMS** Units: **mg/L** Analysis Date: **10/20/2017 06:24 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714286** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	1.001	0.050	1	0.00078	100	75-125	0			

MSD Sample ID: **17101137-01AMSD** Units: **mg/L** Analysis Date: **10/20/2017 06:26 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714287** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	1.032	0.050	1	0.00078	103	75-125	1.001	2.97	20	

The following samples were analyzed in this batch: 1709984-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **107624** Instrument ID **WETCHEM** Method: **SW9045D**

LCS Sample ID: **LCS-107624-107624** Units: **s.u.** Analysis Date: **9/21/2017 10:50 AM**
Client ID: Run ID: **WETCHEM_170921B** SeqNo: **4649898** Prep Date: **9/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	4.04	0.10	4	0	101	90-110	0			

DUP Sample ID: **17091032-01A DUP** Units: **s.u.** Analysis Date: **9/21/2017 10:50 AM**
Client ID: Run ID: **WETCHEM_170921B** SeqNo: **4649901** Prep Date: **9/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	7.82	0.10	0	0	0	0-0	7.62	2.59	20	

DUP Sample ID: **17091032-03A DUP** Units: **s.u.** Analysis Date: **9/21/2017 10:50 AM**
Client ID: Run ID: **WETCHEM_170921B** SeqNo: **4649903** Prep Date: **9/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	7.37	0.10	0	0	0	0-0	7.38	0.136	20	

The following samples were analyzed in this batch: 1709984-05A 1709984-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **R220984** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R220984** Units: **% of sample** Analysis Date: **9/27/2017 08:15 PM**
Client ID: Run ID: **MOIST_170927H** SeqNo: **4663412** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R220984** Units: **% of sample** Analysis Date: **9/27/2017 08:15 PM**
Client ID: Run ID: **MOIST_170927H** SeqNo: **4663411** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.98	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **17091324-12B DUP** Units: **% of sample** Analysis Date: **9/27/2017 08:15 PM**
Client ID: Run ID: **MOIST_170927H** SeqNo: **4663391** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	27.66	0.050	0	0	0	0-0	28.42	2.71	5	

DUP Sample ID: **17091324-18B DUP** Units: **% of sample** Analysis Date: **9/27/2017 08:15 PM**
Client ID: Run ID: **MOIST_170927H** SeqNo: **4663399** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	22.63	0.050	0	0	0	0-0	24.05	6.08	5	R

The following samples were analyzed in this batch:

1709984-01A	1709984-02A	1709984-03A
1709984-04A	1709984-05A	1709984-06A
1709984-07A	1709984-08A	1709984-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **R221200** Instrument ID **WETCHEM** Method: **D2974-00**

MBLK Sample ID: **MB-R221200-R221200** Units: **%** Analysis Date: **9/30/2017 12:20 PM**
Client ID: Run ID: **WETCHEM_170930G** SeqNo: **4670007** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture Content - Method A (105 °C)	ND	0.025								
Ash Content - Method C (440 °C)	ND	0.025								
Organic Matter	ND	0.025								

DUP Sample ID: **1709984-05A DUP** Units: **%** Analysis Date: **9/30/2017 12:20 PM**
Client ID: **TS-5** Run ID: **WETCHEM_170930G** SeqNo: **4670009** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture Content - Method A (105 °C)	10.95	0.025	0	0	0	0-0	11.4	4.03	20	
Ash Content - Method C (440 °C)	96.12	0.025	0	0	0	0-0	96.18	0.0624	20	
Organic Matter	3.88	0.025	0	0	0	0-0	3.82	1.56	20	

The following samples were analyzed in this batch: 1709984-05A 1709984-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

ALS Environmental

Chain of Custody Form

Page ____ of ____

COC ID: 38734

ALS Project Manager: | ALS Work Order #: 1709984

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Ryan Inc (metals) & HBPH (other)	A	MI-10 metals
Work Order		Project Number	032-17-001 to 133-17-00	B	PH
Company Name	Engineering & Environmental Solutions	Bill To Company	Engineering & Environmental Solutions	C	organic content
Send Report To	Blaine Littral	Invoice Attn		D	
Address	400 136th Ave Bldg 100, Suite B	Address	400 136th Ave Bldg 100, Suite B	E F	
City/State/Zip	Holland, MI 49424	City/State/Zip	Holland, MI 49424	G	
Phone	(616) 931-3967	Phone	(616) 931-3967	H	
Fax	(616) 931-3970	Fax	(616) 931-3970	I	
e-Mail Address		e-Mail Address	blaine.littral@goEEsolutions.net	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	TS-1	9-18-17	2:05	topsoil			X										
2	TS-2		2:06				X										
3	TS-3		2:06				X										
4	TS-4		2:07				X										
5	TS-5		2:08					X	X								
6	TS-6		2:27				X										
7	TS-7		2:28				X										
8	TS-8		2:30				X										
9	TS-9		2:31				X										
10	TS-10		2:32					X	X								

Sampler(s) Please Print & Sign: Mitchell Stark

Shipment Method:

Turnaround Time in Business Days (BD): [X] 10 BD [ ] 5 BD [ ] 3 BD [ ] 2 BD [ ] 1 BD [ ] Other

Results Due Date:

Relinquished by: Mitchell Stark | Date: 9/18 | Time: 5:05 pm | Received by:

Relinquished by: | Date: 9/18/17 | Time: 1505 | Received by (Laboratory):

Logged by (Laboratory): MJF | Date: 9-18-17 | Time: 1580 | Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	3.4

QC Package: (Check One Box Below)
- [ ] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SW846/CLP
- [ ] Other
- [ ] TRRP Checklist
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **18-Sep-17 15:30**

Work Order: **1709984** Received by: **DS**

Checklist completed by Nicole Fredericks eSignature 18-Sep-17 Date Reviewed by: Bill Carey eSignature 18-Sep-17 Date

Matrices: Soil

Carrier name: Client

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):	3.4/3.4	sr2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	9/18/20173:38:59 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:

Revision: 1

APPENDIX D

MDEQ CORRESPONDENCE

Coal Yard Closure Plan – Coal Removal Visual Documentation Procedure
Revision 1 – August 10, 2017

Coal removal goals

Holland Board of Public Works (BPW) intends to reclaim as much coal from the site for re-use as fuel as is possible. BPW is currently in the final stages of removing and shipping offsite the upper portion of the remaining coal from the coal yard.

Once the excavation contractors have begun work on-site, one of the initial steps will be to remove the underlying layer of residual coal from the former coal yard that may contain some amounts of aggregate/soil, but which is still usable fuel. To the extent that is feasible, the usable coal mixture will be removed and transferred to facilities having boilers/combustion equipment that are capable of utilizing coal with increased amounts of soil and aggregate.

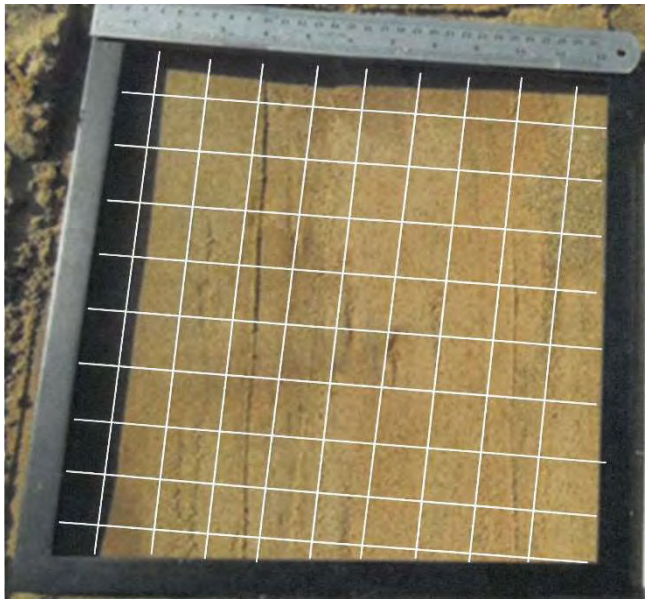
Following removal of the usable coal from the site, the excavation contractors will remove the underlying layer of coal soil mixture. Using the available information from boring logs within the coal yard, the excavation contractor will determine the approximate elevations for the lower limits of the coal layer. The coal removal goal will be to over-excavate approximately 6" of soil/fill material below the lower limit of the coal layer.

Verification documentation

Removal of the coal soil mixture will be documented by surveys of the area before and after removal using GPS methods to determine location and elevation. Each survey will be completed on the verification grid described in later paragraphs. Survey data will be tabulated and a topographic map of each surface will be generated as evidence of the removal. The survey grid will be supplemented if necessary to document grade changes and other irregularities.

HBPW intends to utilize a visual verification method to demonstrate consistency with a *de minimus* goal of an approximate 5% coal / 95% soil by area.

Documentation to provide verification of the visual determination methodology will consist of collecting photographs of the underlying soil after removal of the coal from the coal yard. Photos will be taken depicting the general conditions of the overall coal yard area; both before and after photos of the area will be included. Aerial photos of the area may be used as part of this documentation.



In addition, close up photo documentation of "gridded areas" taken from a standard height (using a monopod or tripod) of a 1'x1'square wooden grid frame containing scaled grid markings depicting 100

sub-grid squares. It is anticipated that a grid frame will be constructed similar to the example depicted in the adjacent photo. The grid frame will assist in providing a visual assessment that residual coal does not exceed more than 5% of the area within the grid frame. A systematic numbering process will be used on each photo correlating with a site map showing the approximate grid locations where the photos were taken.

Utilizing information contained in the MDEQ's Sampling Strategies and Statistics Training Materials (S3TM) guidance manual, due to the irregular shaped dimensions, calculations result in an approximate grid spacing ranging from 35 to 38 feet for the area of the former coal yard, depicted on Exhibit V-001, Existing Conditions July 2017. To facilitate laying out the grid spacing on site, a grid interval of approximately 33.33 feet will be used. This will result in a preliminary grid pattern having approximately 250 grid intersections within the former coal yard area as depicted on Figure 1; the total number may change depending on configuation of the grid pattern in the field. Close up photo documentation, as described above using the grid frame, will be taken at half of the grid intersections.

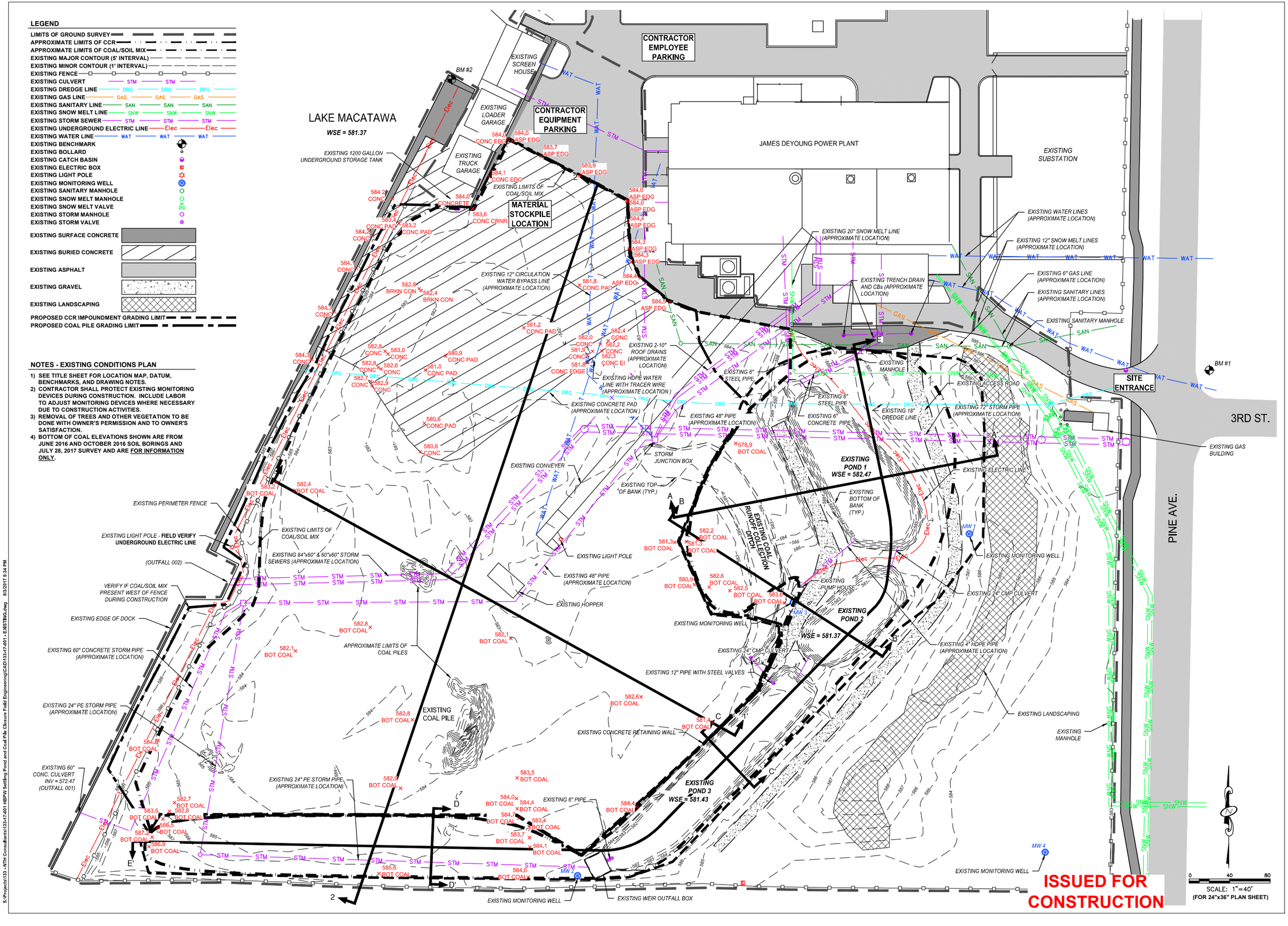
It is not anticipated that the subsurface layer of coal soil mixture will interface with the shallow groundwater table in many locations. However, If there are areas where the contractor encounters groundwater or areas where storm water collects during excavation activity, the water will be pumped to the adjacent settling ponds using trash pumps to allow for excavation to continue. Photo documentaion and survey elevations will be collected as soon as material is removed from these areas.

LEGEND

- LIMITS OF GROUND SURVEY
- APPROXIMATE LIMITS OF CCR
- APPROXIMATE LIMITS OF COAL/SOIL MIX
- EXISTING MAJOR CONTOUR (5' INTERVAL)
- EXISTING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM
- EXISTING DREDGE LINE — DRG
- EXISTING GAS LINE — GAS
- EXISTING SANITARY LINE — SAN
- EXISTING SNOW MELT LINE — SNW
- EXISTING STORM SEWER — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec
- EXISTING WATER LINE — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING BURIED CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- PROPOSED CCR IMPOUNDMENT GRADING LIMIT
- PROPOSED COAL PILE GRADING LIMIT

NOTES - EXISTING CONDITIONS PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.
3) REMOVAL OF TREES AND OTHER VEGETATION TO BE DONE WITH OWNER'S PERMISSION AND TO OWNER'S SATISFACTION.
4) BOTTOM OF COAL ELEVATIONS SHOWN ARE FROM JUNE 2016 AND OCTOBER 2016 SOIL BORINGS AND JULY 28, 2017 SURVEY AND ARE FOR INFORMATION ONLY.



S:\Projects\133 - NTH Consultants\133-17-001 HBPW Settling Pond and Coal Pile Closure Field Engineering\CAD\133-17-001 - EXISTING.dwg 8/2/2017 5:34 PM

Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B, Holland, Michigan 49424
Phone/Fax: (616) 994-6541
www.gvEESolutions.com

COAL PILE AND CCR SURFACE IMPOUNDMENT SYSTEM CLOSURES
HOLLAND BOARD OF PUBLIC WORKS
SECTION 30 T. 5 N., R. 15 W., CITY OF HOLLAND, OTTAWA COUNTY
JAMES DEYOUNG POWER PLANT
HOLLAND, MICHIGAN

MARK	DATE	DESCRIPTION
	09-22-2017	ISSUED FOR CONSTRUCTION
	04-17-2017	ISSUED FOR BID
	03-22-2017	ISSUED FOR 90% REVIEW MEETING
	02-09-2017	ISSUED FOR OWNER REVIEW
	01-24-2017	ISSUED FOR OWNER REVIEW
	01-17-2017	ISSUED FOR INTERNAL REVIEW

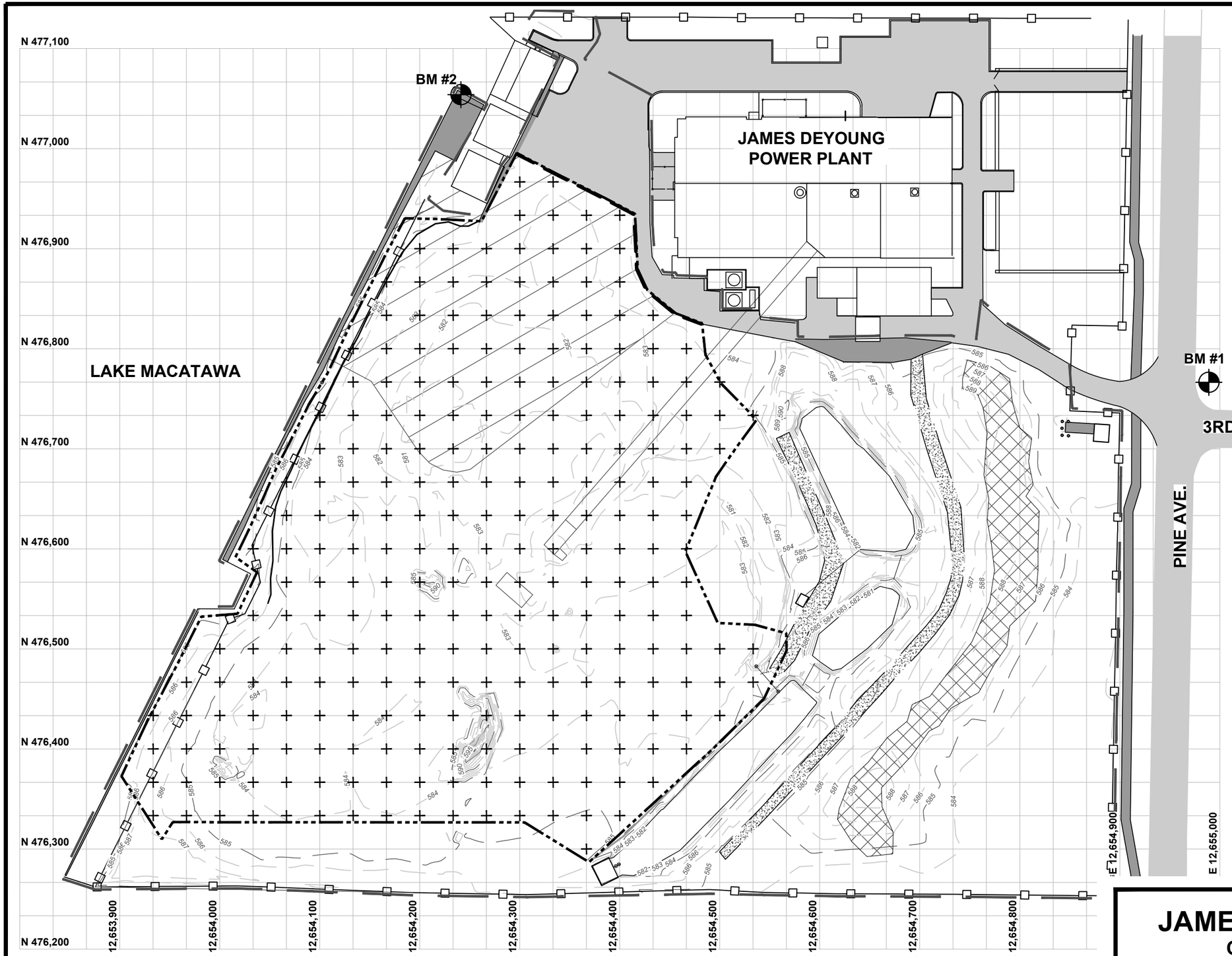
DESIGNED BY:	DS
DRAWN BY:	AM
CHECKED BY:	BL
PROJECT NO:	133-17-001

SHEET TITLE

EXISTING CONDITIONS JULY 2017

SHEET 2 OF 7

V-001



LEGEND

- APPROXIMATE LIMITS OF COAL/SOIL MIX
- BEGINNING MAJOR CONTOUR (5' INTERVAL)
- BEGINNING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING BENCHMARK
- EXISTING SURFACE CONCRETE
- EXISTING BURIED CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- GRID NODE +

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. EXISTING CONTOURS SHOWN ARE FROM THE JULY 28, 2017 SURVEY.
4. UTILITIES ARE NOT SHOWN FOR CLARITY

N

DRAFT

JAMES DEYOUNG POWER PLANT

COAL REMOVAL DOCUMENTATION - GRID NODES

SCALE	1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET			1	

Brad Venman

From: Unseld, Timothy (DEQ) <UNSELDT@michigan.gov>
Sent: Thursday, August 10, 2017 4:12 PM
To: Brad Venman; Roskoskey, Duane (DEQ); Sellers, Fred (DEQ); Walters, Kent (DEQ)
Cc: Radakovitz, Mike; Siler, Ted; Monroe, Jane; blaine.litteral@goeesolutions.net; Visscher, Judy
Subject: RE: Holland BPW - James De Young coal yard remediation project

Brad and Judy,

The Coal Yard Closure Plan – Coal Removal Visual Documentation Procedure, Revision 1 – August 10, 2017 received today is approved.

Please let me (and/or Kent) know if you need further assistance during this project.

From: Brad Venman [mailto:BVenman@nthconsultants.com]
Sent: Thursday, August 10, 2017 3:14 PM
To: Unseld, Timothy (DEQ) <UNSELDT@michigan.gov>; Roskoskey, Duane (DEQ) <ROSKOSKEYD@michigan.gov>; Sellers, Fred (DEQ) <SELLERSF@michigan.gov>; Walters, Kent (DEQ) <WaltersK7@michigan.gov>
Cc: Radakovitz, Mike <mradakovitz@hollandbpw.com>; Siler, Ted <tsiler@hollandbpw.com>; Monroe, Jane <jmonroe@hollandbpw.com>; blaine.litteral@goeesolutions.net; Visscher, Judy <jvisscher@hollandbpw.com>
Subject: RE: Holland BPW - James De Young coal yard remediation project

Tim,
The attached version incorporates the modifications we've made addressing your comments.

Thanks for your help.

Regards,

Brad

Brad Venman
NTH Consultants, Ltd.
(517) 702-2956 (direct)
(517) 881-0335 (cell)

From: Unseld, Timothy (DEQ) [mailto:UNSELDT@michigan.gov]
Sent: Wednesday, August 9, 2017 3:03 PM
To: Brad Venman <BVenman@nthconsultants.com>; Roskoskey, Duane (DEQ) <ROSKOSKEYD@michigan.gov>; Sellers, Fred (DEQ) <SELLERSF@michigan.gov>; Walters, Kent (DEQ) <WaltersK7@michigan.gov>
Cc: Radakovitz, Mike <mradakovitz@hollandbpw.com>; Siler, Ted <tsiler@hollandbpw.com>; Monroe, Jane

<jmonroe@hollandbpw.com>; blaine.litteral@goeesolutions.net; Visscher, Judy <jvisscher@hollandbpw.com>
Subject: RE: Holland BPW - James De Young coal yard remediation project

Brad,

We have a few very minor comments on the verification plan.

1. Please ensure that you take plenty of photos of the overall area giving a perspective on how it looks. Before and after may also be valuable. Judy did say you were planning a drone to capture an overview of the entire area. I think this would be very helpful.
2. You should propose documentation of elevations at points along the gridded area. These elevations should be compared to elevations where coal was encountered in the borings and also during coal removal activities which are currently underway. A surface map and a grid table comparing elevations (final vs. coal/soil contact) would be very helpful to document/prove removal (elevation being a second line of evidence).
3. You should plan on how you will photo document close-ups of grid points that may be at the water table or slightly below the water table.

From: Brad Venman [mailto:BVenman@nthconsultants.com]
Sent: Friday, August 04, 2017 2:40 PM
To: Unseld, Timothy (DEQ) <UNSELDT@michigan.gov>; Roskoskey, Duane (DEQ) <ROSKOSKEYD@michigan.gov>; Sellers, Fred (DEQ) <SELLERSF@michigan.gov>
Cc: Radakovitz, Mike <mradakovitz@hollandbpw.com>; Siler, Ted <tsiler@hollandbpw.com>; Monroe, Jane <jmonroe@hollandbpw.com>; blaine.litteral@goeesolutions.net; Visscher, Judy <jvisscher@hollandbpw.com>
Subject: RE: Holland BPW - James De Young coal yard remediation project

Good afternoon Tim,

Consistent with the things we discussed on Tuesday, we have developed a Conceptual Coal Removal Visual Documentation Procedure for your review and comment. Copies of the draft procedure and the referenced figures are attached.

We look forward to working with you as we proceed with the project.

Regards,

Brad Venman
NTH Consultants, Ltd.
517.702.2956
517.881.0335

From: Visscher, Judy [mailto:jvisscher@hollandbpw.com]
Sent: Tuesday, August 1, 2017 5:16 PM
To: unseldt@michigan.gov; roskoskeyd@michigan.gov; Sellers, Fred (DEQ) (SELLERSF@michigan.gov) <SELLERSF@michigan.gov>
Cc: Brad Venman <BVenman@nthconsultants.com>; Radakovitz, Mike <mradakovitz@hollandbpw.com>; Siler, Ted <tsiler@hollandbpw.com>; Monroe, Jane <jmonroe@hollandbpw.com>; blaine.litteral@goeesolutions.net
Subject: Holland BPW - James De Young coal yard remediation project
Importance: High

Thank you for the recent phone discussion regarding the James De Young Generating Facility coal yard remediation.

We agree to the following:

1. 5% de minimus coal left on site in the former coal yard will constitute “clean closure”
2. Verification of this de minimus amount will be by visual methods (*verification plan to be submitted to MDEQ shortly by Brad Venman of NTH consultants*)
3. Coal/soil mixture from the former coal yard will be disposed of in the HBPW Zeeland Township Landfill
4. The Perpetual Care Fund (PCF) for the HBPW Zeeland Township Landfill will be funded an additional $3254 (*to make up for the error of being previously classified as segregated*)
5. The coal/soil mixture that will be placed in the HBPW Zeeland Township Landfill will be charged at $0.75/ton instead of $0.075/ton (*same reason as in #4*)

We understand that our agreement on the points listed above will release a letter from the MDEQ authorizing the 5% de minimus, enabling Holland BPW to proceed with the coal yard remediation project, which is scheduled to begin August 7.

This letter from the MDEQ should be sent via email to my attention.

If there are any questions on the above, please contact me.

Regards,

Judy N. Visscher
Environmental Regulatory Specialist

Holland Board of Public Works
625 Hastings Avenue, Holland, MI 49423-5427

jvisscher@hollandbpw.com
office: 616-355-1210 cell: 616-405-0213

APPENDIX E

AS-CONSTRUCTED DRAWINGS

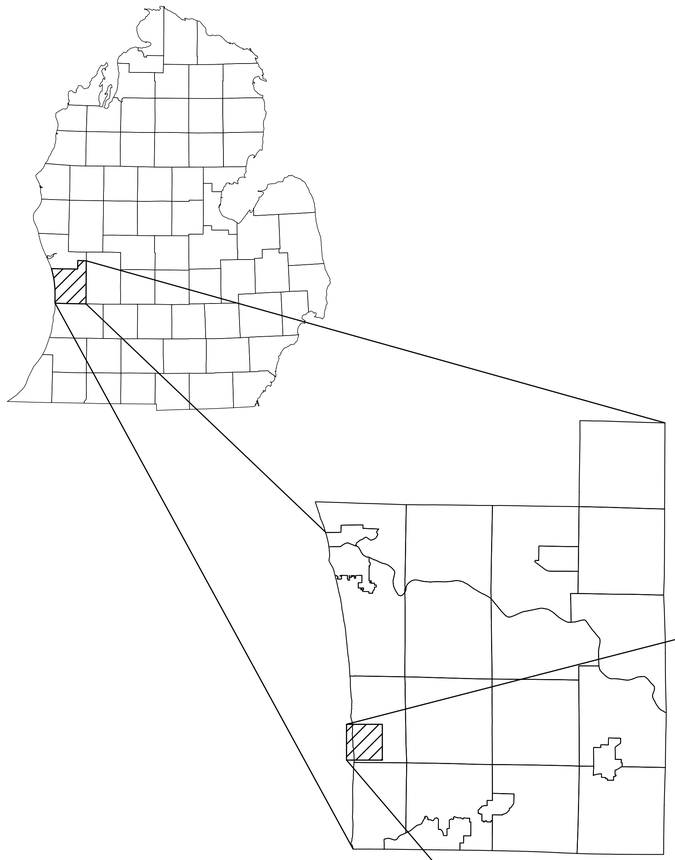
G-001 TITLE SHEET

V-001 EXISTING CONDITIONS JULY 2017

C-101 REMOVAL RECORD

C-102 FINAL GRADING RECORD

C-501 COAL YARD GRID POINT ELEVATIONS

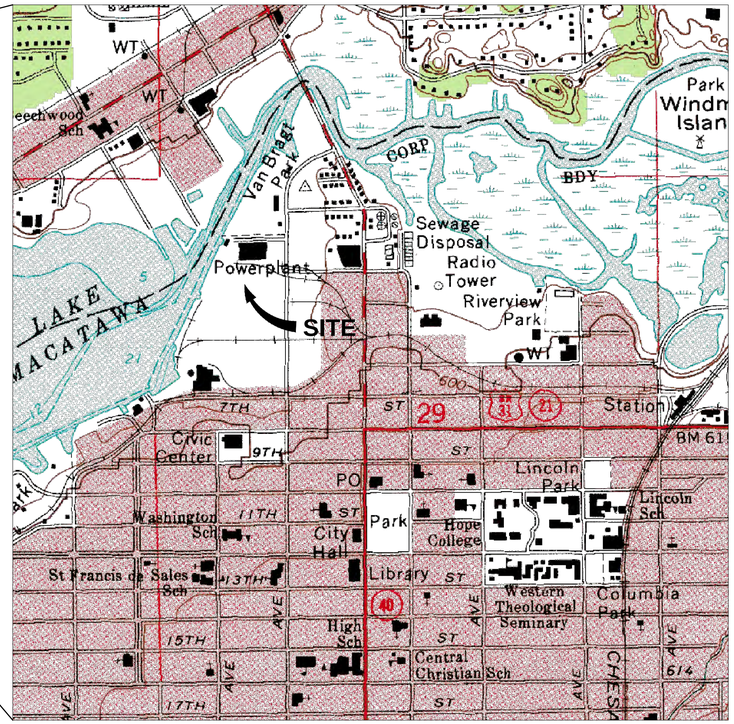


COAL PILE CLOSURE

HOLLAND BOARD OF PUBLIC WORKS
JAMES DEYOUNG POWER PLANT

PREPARED BY:
Engineering & Environmental Solutions, LLC
PROJECT NO: 133-17-001

AUGUST 2018



SHEET INDEX

#	SHEET TIT
G-001	TITLE SHE
V-001	EXISTING C
C-101	REMOVAL
C-102	FINAL GRA
C-501	COAL YAR

DATUM AND BENC

DATUM: NAVD88, MI
SOUTH ZON

BENCHMARK 1: BO
N =
E =
ELE

BENCHMARK 2: CO
N =
E =
ELE

DRAWING NOTES

1) EXISTING GROUN
AND JULY 28, 201
JULY 28, 2017.

2) SOIL BORINGS CO

3) CLEAN ELEVATIO
2017.

4) FINAL GRADING A
DECEMBER 7, 8, A
JUNE 1, 2018.

64 PINE AVE, HOLLAND, MICHIGAN
SECTION 30 T. 5 N., R. 15 W.
CITY OF HOLLAND
OTTAWA COUNTY, MICHIGAN

LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR (5' INTERVAL)
- EXISTING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM — STM
- EXISTING DREDGE LINE — DRG — DRG — DRG
- EXISTING GAS LINE — GAS — GAS — GAS
- EXISTING SANITARY LINE — SAN — SAN — SAN
- EXISTING SNOW MELT LINE — SNW — SNW — SNW
- EXISTING STORM SEWER — STM — STM — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec — Elec
- EXISTING WATER LINE — WAT — WAT — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING

NOTES - EXISTING CONDITIONS PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.
3) REMOVAL OF TREES AND OTHER VEGETATION TO BE DONE WITH OWNER'S PERMISSION AND TO OWNER'S SATISFACTION.
4) BOTTOM OF COAL ELEVATIONS SHOWN ARE FROM JUNE 2016 AND OCTOBER 2016 SOIL BORINGS AND JULY 28, 2017 SURVEY AND ARE FOR INFORMATION ONLY.

LAKE MACATAWA
WSE = 581.37

JAMES DEYOUNG POWER PLANT

EXISTING POND 1
WSE = 582.47

EXISTING POND 2
WSE = 581.37

EXISTING POND 3
WSE = 581.43

EXISTING COAL PILE

EXISTING COAL RUNOFF COLLECTION DITCH

BM #2

EXISTING SCREEN HOUSE

EXISTING LOADER GARAGE

EXISTING TRUCK GARAGE

EXISTING 1200 GALLON UNDERGROUND STORAGE TANK

EXISTING LIMITS OF COAL/SOIL MIX

EXISTING 12" CIRCULATION WATER BYPASS LINE (APPROXIMATE LOCATION)

EXISTING 20" SNOW MELT LINE (APPROXIMATE LOCATION)

EXISTING TRENCH DRAIN AND CBs (APPROXIMATE LOCATION)

EXISTING 2-10" ROOF DRAINS (APPROXIMATE LOCATION)

EXISTING 6" STEEL PIPE

EXISTING HDPE WATER LINE WITH TRACER WIRE (APPROXIMATE LOCATION)

EXISTING CONCRETE PAD (APPROXIMATE LOCATION)

EXISTING 48" PIPE (APPROXIMATE LOCATION)

EXISTING 6" CONCRETE PIPE

EXISTING 18" DREDGE LINE

EXISTING 72" STORM PIPE (APPROXIMATE LOCATION)

EXISTING ACCESS ROAD

EXISTING MANHOLE

STORM JUNCTION BOX

EXISTING CONVEYER

EXISTING TOP OF BANK (TYP.)

EXISTING BOTTOM OF BANK (TYP.)

EXISTING LIGHT POLE

EXISTING HOPPER

EXISTING PUMP HOUSE

EXISTING ELECTRIC LINE

EXISTING MONITORING WELL

EXISTING 24" CMP CULVERT

EXISTING 4" HDPE PIPE (APPROXIMATE LOCATION)

EXISTING 12" PIPE WITH STEEL VALVES

EXISTING CONCRETE RETAINING WALL

EXISTING WEIR OUTFALL BOX

EXISTING PERIMETER FENCE

EXISTING LIMITS OF COAL/SOIL MIX

EXISTING 84"x60" & 60"x60" STORM SEWERS (APPROXIMATE LOCATION)

(OUTFALL 002)

VERIFY IF COAL/SOIL MIX PRESENT WEST OF FENCE DURING CONSTRUCTION

EXISTING EDGE OF DOCK

EXISTING 60" CONCRETE STORM PIPE (APPROXIMATE LOCATION)

EXISTING 24" PE STORM PIPE (APPROXIMATE LOCATION)

EXISTING 60" CONC. CULVERT INV ≈ 572.47 (OUTFALL 001)

APPROXIMATE LIMITS OF COAL PILES

EXISTING 24" PE STORM PIPE (APPROXIMATE LOCATION)

MW 1 MW 2 MW 3

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LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR (5' INTERVAL)
- EXISTING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM — STM
- EXISTING DREDGE LINE — DRG — DRG — DRG
- EXISTING GAS LINE — GAS — GAS — GAS
- EXISTING SANITARY LINE — SAN — SAN — SAN
- EXISTING SNOW MELT LINE — SNW — SNW — SNW
- EXISTING STORM SEWER — STM — STM — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec — Elec
- EXISTING WATER LINE — WAT — WAT — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- COAL PILE GRADING LIMIT
- EXCAVATION MAJOR CONTOUR (5' INTERVAL)
- EXCAVATION MINOR CONTOUR (1' INTERVAL)

NOTES - REMOVAL PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.
3) REMOVAL OF TREES AND OTHER VEGETATION TO BE DONE WITH OWNER'S PERMISSION AND TO OWNER'S SATISFACTION.
4) OWNER TO PROVIDE AREAS FOR TEMPORARY FACILITIES, STOCKPILE AREAS, EQUIPMENT PARKING, AND HAUL ROUTES.
5) MW 1 THROUGH MW 3 SHALL BE ABANDONED OR REMOVED PER HOLLAND MDEQ STANDARD PROTOCOL.
6) EXCAVATE TO LIMITS OF COAL/SOIL MIXTURE AS DETERMINED BY THE OWNER.
7) EXCAVATE TO LIMITS OF CCR CONTAMINATED SOILS AND COAL-SOIL MIXTURE AS DETERMINED BY THE OWNER. DEWATERING WILL BE REQUIRED.

LAKE MACATAWA

BM #2

EXISTING SCREEN HOUSE

EXISTING LOADER GARAGE

EXISTING TRUCK GARAGE

JAMES DEYOUNG POWER PLANT

EXISTING 1200 GALLON UNDERGROUND STORAGE TANK **TO REMAIN**

EXISTING 12" CIRCULATION WATER BYPASS LINE (APPROXIMATE LOCATION) **TO REMAIN**

EXISTING HDPE WATER LINE WITH TRACER WIRE (APPROXIMATE LOCATION) **TO REMAIN**

EXISTING CONCRETE PAD (APPROXIMATE LOCATION) **TO REMAIN AND BE CLEANED**

ELECTRICAL CONDUIT REMOVED UP TO LIGHTPOLE

EXISTING LIMITS OF COAL/SOIL MIX

EXISTING CONVEYER **REMOVE** REMOVED **(ALTERNATE)**

EXISTING PERIMETER FENCE REMOVED/REPLACED **REMOVE/REPACE AS NEEDED**

EXISTING LIGHT POLE - **FIELD VERIFY UNDERGROUND ELECTRIC LINE TO REMAIN** ~~REMOVED~~

(OUTFALL 002) **OUTFALL SHACK** ~~TO REMAIN~~ REMOVED

EXISTING 84"x60" & 60"x60" STORM SEWERS (APPROXIMATE LOCATION) **TO REMAIN**

EXISTING LIGHT POLE **REMOVE** REMOVED

EXISTING 48" PIPE (APPROXIMATE LOCATION) **TO REMAIN**

EXISTING HOPPER REMOVED **REMOVE TO A MINIMUM 3 FT BELOW FINAL GRADE**

EXISTING EDGE OF DOCK

ELECTRICAL CONDUIT INACTIVE, LEFT IN PLACE

EXISTING 60" CONC. CULVERT INV ≈ 572.47 (OUTFALL 001) **OUTFALL SHACK** ~~TO REMAIN~~ REMOVED

EXISTING COAL RUNOFF COLLECTION DITCH

EXISTING POND 1

EXISTING POND 2

EXISTING POND 3

EXISTING

BOT COAL 583.2
BOT COAL 582.4
BOT COAL 582.8
BOT COAL 582.1
BOT COAL 582.1
BOT COAL 582.6
BOT COAL 582.8
BOT COAL 583.5
584.0
BOT COAL 584.4
584.7
BOT COAL 583.4
BOT COAL

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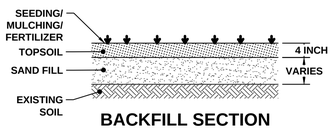
LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR AFTER EXC. (5' INTERVAL)
- EXISTING MINOR CONTOUR AFTER EXC. (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM — STM
- EXISTING DREDGE LINE — DRG — DRG — DRG
- EXISTING GAS LINE — GAS — GAS — GAS
- EXISTING SANITARY LINE — SAN — SAN — SAN
- EXISTING SNOW MELT LINE — SNW — SNW — SNW
- EXISTING STORM SEWER — STM — STM — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec — Elec
- EXISTING WATER LINE — WAT — WAT — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL (W)
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- COAL PILE GRADING LIMIT
- EXCAVATION MAJOR CONTOUR (5' INTERVAL)
- EXCAVATION MINOR CONTOUR (1' INTERVAL)
- GRID POINT 1

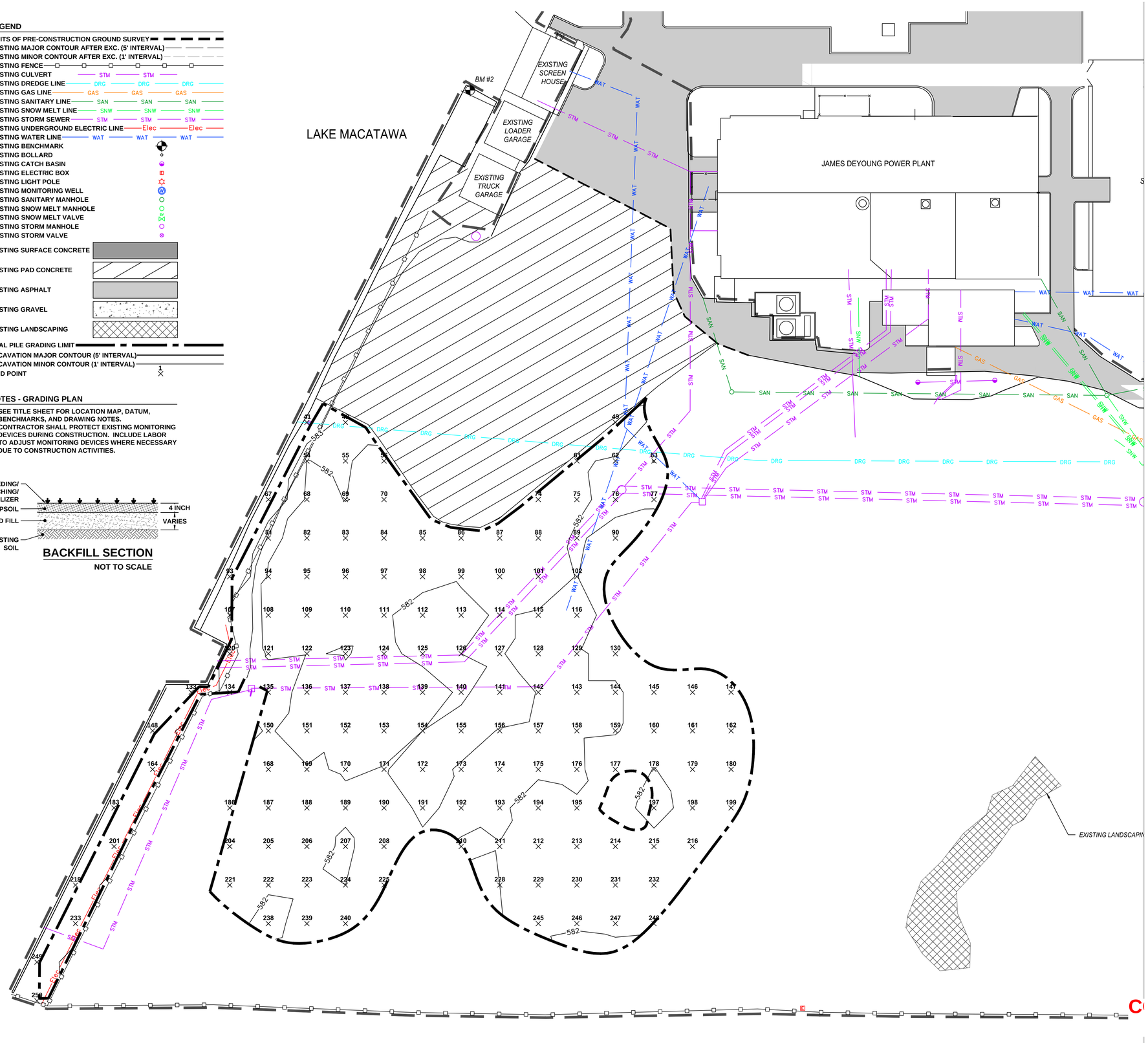
NOTES - GRADING PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.



BACKFILL SECTION

NOT TO SCALE



Point Number	Northing	Easting	Original Elevation	Cleaned Elevation	Sand Elevation	Topsoil Elevation
41	476766.67	12654100.00	583.93	583.34	583.91	584.25
42	476766.67	12654133.33	583.24	582.20	581.84	582.51
49	476766.67	12654366.67	581.73	579.14	580.84	581.51
54	476733.33	12654100.00	584.86	581.81	581.40	581.99
55	476733.33	12654133.33	583.01	581.78	581.42	582.08
56	476733.33	12654166.67	582.12	580.74	581.13	581.63
61	476733.33	12654333.33	582.05	579.58	581.35	581.94
62	476733.33	12654366.67	581.90	580.35	581.57	582.07
63	476733.33	12654400.00	581.63	580.52	581.58	582.00
67	476700.00	12654066.67	585.52	582.67	583.45	584.11
68	476700.00	12654100.00	583.33	581.33	581.27	581.85
69	476700.00	12654133.33	582.70	581.84	581.67	582.01
70	476700.00	12654166.67	581.67	580.23	581.51	581.92
74	476700.00	12654300.00	582.17	579.49	581.44	581.94
75	476700.00	12654333.33	582.29	579.69	581.49	581.91
76	476700.00	12654366.67	583.11	579.99	581.57	582.15
77	476700.00	12654400.00	581.92	579.54	581.64	582.06
81	476666.67	12654066.67	585.30	581.60	581.81	582.15
82	476666.67	12654100.00	583.33	580.90	581.40	581.74
83	476666.67	12654133.33	582.72	581.66	581.38	581.80
84	476666.67	12654166.67	582.30	580.20	581.39	581.72
85	476666.67	12654200.00	581.95	579.92	581.60	581.93
86	476666.67	12654233.33	582.40	579.84	581.52	581.86
87	476666.67	12654266.67	582.49	577.76	581.44	581.77
88	476666.67	12654300.00	582.47	580.07	581.33	581.74
89	476666.67	12654333.33	582.74	579.61	581.56	582.06
90	476666.67	12654366.67	582.98	579.78	581.41	581.82
93	476633.33	12654033.33	584.46	583.43	583.92	584.25
94	476633.33	12654066.67	584.62	581.15	581.42	581.92
95	476633.33	12654100.00	583.65	581.23	581.04	581.88
96	476633.33	12654133.33	584.00	579.70	581.45	581.87
97	476633.33	12654166.67	583.48	579.66	581.12	581.79
98	476633.33	12654200.00	583.00	580.03	581.23	581.90
99	476633.33	12654233.33	583.04	579.82	581.48	581.98
100	476633.33	12654266.67	582.83	580.55	581.57	581.90
101	476633.33	12654300.00	582.85	580.82	581.49	581.82
102	476633.33	12654333.33	583.91	579.75	581.68	582.01
107	476600.00	12654033.33	585.21	581.80	582.00	582.34
108	476600.00	12654066.67	584.36	583.45	581.52	581.93
109	476600.00	12654100.00	583.66	582.73	581.48	581.90
110	476600.00	12654133.33	584.20	580.61	581.30	581.96
111	476600.00	12654166.67	583.64	580.29	581.38	581.96
112	476600.00	12654200.00	583.12	580.02	581.56	582.14
113	476600.00	12654233.33	583.31	580.33	581.05	582.05
114	476600.00	12654266.67	582.90	580.94	580.98	581.98
115	476600.00	12654300.00	583.20	581.38	581.69	582.03
116	476600.00	12654333.33	584.19	hopper	581.73	582.23
120	476566.67	12654033.33	584.76	582.07	582.30	582.72
121	476566.67	12654066.67	584.80	583.28	581.60	581.94
122	476566.67	12654100.00	584.13	581.69	581.49	581.99

Point Number	Northing	Easting	Original Elevation	Cleaned Elevation	Sand Elevation	Topsoil Elevation
123	476566.67	12654133.33	584.36	581.46	581.51	582.01
124	476566.67	12654166.67	583.60	580.17	581.60	581.94
125	476566.67	12654200.00	588.58	581.10	581.74	582.07
126	476566.67	12654233.33	583.60	581.48	581.50	582.00
127	476566.67	12654266.67	583.48	580.58	581.32	581.98
128	476566.67	12654300.00	582.98	hopper	581.71	582.13
129	476566.66	12654333.35	581.94	580.33	581.62	582.03
130	476566.58	12654366.73	582.66	580.68	581.59	581.93
133	476533.33	12654000.00	584.41	583.20	583.13	583.72
134	476533.33	12654033.33	586.10	582.24	582.07	582.73
135	476533.33	12654066.67	584.65	580.22	582.00	582.33
136	476533.33	12654100.00	584.35	582.79	581.45	581.79
137	476533.33	12654133.33	584.50	582.35	581.62	581.95
138	476533.33	12654166.67	583.53	581.06	581.47	581.81
139	476533.33	12654200.00	583.18	581.84	581.53	581.86
140	476533.33	12654233.33	583.43	581.79	581.70	582.04
141	476533.33	12654266.67	583.26	581.57	581.53	581.87
142	476533.34	12654300.01	583.52	579.24	581.68	582.01
143	476533.35	12654333.32	582.76	580.96	581.69	582.03
144	476533.30	12654366.68	582.97	581.02	581.69	582.03
145	476533.31	12654399.95	583.37	581.11	581.54	581.88
146	476533.38	12654433.30	583.33	581.07	581.17	581.84
147	476533.37	12654466.58	583.30	581.46	581.22	581.56
148	476500.00	12653966.67	585.12	583.18	582.86	583.53
150	476499.85	12654066.56	583.81	578.94	581.72	582.06
151	476500.00	12654100.00	583.84	579.68	581.21	581.71
152	476500.00	12654133.33	583.71	581.96	581.61	581.95
153	476500.00	12654166.67	583.51	582.53	581.58	581.91
154	476500.00	12654200.00	583.40	582.27	581.66	582.00
155	476500.00	12654233.33	583.39	582.13	581.58	581.92
156	476499.97	12654266.64	583.50	580.36	581.68	582.01
157	476499.97	12654299.95	583.08	580.55	581.71	582.04
158	476499.98	12654333.35	582.76	581.14	581.72	582.06
159	476500.01	12654366.65	583.09	580.98	581.70	582.03
160	476499.98	12654399.98	583.59	581.21	581.45	581.78
161	476499.96	12654433.36	583.58	581.22	581.37	581.79
162	476499.97	12654466.69	583.32	581.05	581.52	581.85
164	476466.67	12653966.67	586.41	579.58	583.25	583.75
168	476466.67	12654066.67	583.66	580.04	581.52	582.02
169	476466.67	12654100.00	583.43	581.69	581.70	582.04
170	476466.67	12654133.33	583.45	582.29	581.63	581.97
171	476466.67	12654166.67	583.51	582.31	581.51	582.01
172	476466.67	12654200.00	583.84	582.16	581.60	581.93
173	476466.67	12654233.33	583.42	582.18	581.68	582.02
174	476466.68	12654266.64	583.44	581.81	581.52	582.02
175	476466.63	12654299.99	583.32	581.45	581.54	582.04
176	476466.62	12654333.35	583.29	581.39	581.66	582.07
177	476466.68	12654366.67	583.29	580.78	581.15	581.74
178	476466.67	12654400.02	583.86	581.25	581.68	582.01
179	476466.71	12654433.27	583.54	581.49	581.30	581.80

Point Number	Northing	Easting	Original Elevation	Cleaned Elevation	Sand Elevation
180	476466.65	12654466.69	583.48	581.81	581.48
183	476433.33	12653933.33	585.27	583.66	583.37
186	476433.38	12654033.38	584.22	579.73	581.52
187	476433.36	12654066.64	583.68	579.38	581.47
188	476433.31	12654099.99	583.48	579.41	581.54
189	476433.31	12654133.39	583.67	579.66	581.74
190	476433.26	12654166.64	584.02	582.28	581.90
191	476433.40	12654200.04	583.86	582.53	581.58
192	476433.26	12654233.19	583.51	581.94	581.71
193	476433.34	12654266.69	588.35	582.12	581.62
194	476433.32	12654300.00	583.70	581.58	581.56
195	476433.34	12654333.35	583.85	581.20	581.63
197	476433.36	12654400.01	583.96	580.88	581.82
198	476433.35	12654433.34	583.58	581.97	581.35
199	476433.33	12654466.67	583.78	581.89	581.28
201	476400.00	12653933.33	586.27	581.37	583.39
204	476400.00	12654033.33	583.72	580.81	581.76
205	476400.07	12654066.67	583.72	578.69	581.57
206	476400.08	12654100.00	583.70	578.75	581.53
207	476400.09	12654133.25	583.98	579.20	581.60
208	476399.98	12654166.65	583.80	583.72	581.55
210	476400.09	12654233.27	584.11	582.87	581.46
211	476400.03	12654266.65	590.66	582.12	581.41
212	476400.00	12654299.99	583.97	582.61	581.42
213	476399.96	12654333.32	584.08	582.48	581.64
214	476400.00	12654366.63	584.30	581.05	581.36
215	476400.02	12654400.04	583.99	582.94	581.19
216	476400.04	12654433.36	584.32	583.07	581.30
218	476366.67	12653900.00	584.34	583.56	583.32
221	476366.72	12654033.40	583.84	578.90	581.61
222	476366.67	12654066.65	583.62	580.86	581.45
223	476366.66	12654099.99	583.67	580.00	581.55
224	476366.67	12654133.43	583.97	580.06	581.66
225	476366.66	12654166.67	583.54	581.16	581.73
228	476366.66	12654266.70	584.13	582.53	581.58
229	476366.66	12654299.98	584.15	582.81	581.23
230	476366.69	12654333.29	584.39	583.18	581.55
231	476366.63	12654366.63	584.40	583.42	581.31
232	476366.65	12654399.96	584.32	583.19	581.33
233	476333.33	12653900.00	584.51	583.56	583.43
238	476333.30	12654066.67	583.94	581.07	581.58
239	476333.32	12654099.98	584.02	580.79	581.78
240	476333.36	12654133.37	584.18	580.97	581.52
245	476333.33	12654299.95	584.58	583.59	581.42
246	476333.33	12654333.33	584.82	582.24	581.59
247	476333.33	12654366.67	585.10	584.04	581.54
248	476333.33	12654400.00	584.66	582.34	581.57
249	476300.00	12653866.67	584.22	583.67	583.14
250	476266.67	12653866.67	584.43	583.39	583.14

ATTACHMENTS

A.1- A.4

A.1 - Coal Yard Closure Report

A.2 - CCR Impoundment Closure Report

A.3 - CCR Beneficial Use Documentation Report

A.4 –Addendum Rpt_Rev 2

PARTIAL CLOSURE CERTIFICATION

James DeYoung Power Plant

Coal Combustion Residual (CCR) Impoundments

Holland Board of Public Works

Holland, Michigan

NTH Project No. 73-160017-05

September 2018

NTH Consultants, Ltd.
608 S, Washington Avenue
Lansing, MI 48933

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

This report documents the closure of the Coal Combustion Residual (CCR) impoundments at the James DeYoung power plant owned by the Holland Board of Public Works (HPBW). The plant is located at 64 Pine Avenue in Holland, Michigan near the eastern end of Lake Macatawa. A closure plan, created by NTH Consultants, Ltd., dated October 17, 2016, outlined the steps necessary to close the CCR impoundment area, including the three existing CCR impoundment ponds and historic CCR handling areas in accordance with Part 257 of Title 40, Protection of Environment, of the Code of Federal Regulations. Specifically, this report documents closure by removal of CCR in accordance with 257.102(c) and provides certification of the closure activities completed in accordance with 257.102(f)(3)

The closure of the James DeYoung CCR Surface Impoundment System was completed from August 2017 to May 2018, and site restoration was completed in June 2018. Site activities included the removal of CCR material found in the surface impoundment /ash handling areas for the closure of the three incised surface impoundment ponds and backfilled with sand, topsoil and vegetative cover. Verification points for clean closure were visually observed for CCR removal to *de minimus* levels and consisted of soil samples collected at 25 percent of these points for analytical testing. Quality assurance activities included surveying, material testing, reviewing laboratory analytical results, and related closure activity observations completed in the CCR area. Laboratory test results for soil samples were compared to applicable standards to verify that CCR was sufficiently removed prior to granular fill and topsoil being placed on the verified area.

This project was also completed in substantial conformance with standard construction practices, project specifications and Part 115 of the Natural Resources Protection Act, 1994, PA 451, as amended.

1.1 PERSONNEL

The key personnel involved in the construction of this project are listed below:

Owner - Holland Board of Public Works (HBPW)

Jane Monroe, Project Manager
Andrew Reynolds, Project Engineer/ Certified Construction Storm Water Management Operator
Theo VanAken, Certified Construction Storm Water Management Operator
Fred Heiser, Electric Production Maintenance Supervisor
Mike Radakovitz, Electric Production Superintendent
Judy Visscher, Environmental Regulatory Specialist

Program Management - NTH Consultants, Ltd. (NTH)

Jeff Jaros, Project Manager
David Lutz, P.E., Project Engineer
Brad Venman, Toxicologist

Engineering Design and Construction Verification – Engineering & Environmental Solutions, LLC (E&E Solutions)

Blaine Litteral, P.E., CQA Field Officer
Daniel J. Schaafsma, P.E., Project Engineer
Kurt Van Appledorn, P.G., Project Geologist
Mitchell Stark, CQA Field Engineer
Amy Mandrell, CQA Field Engineer

General Contractor - Ryan Incorporated Central (Ryan Inc.)

Chris Downs, General Superintendent
John Lafferty, Operations Manager
Robert Koski, Site Superintendent
John Burt, Contract Administration

Soil Testing Laboratory - Driesenga & Associates, Inc. (Driesenga)

Jake Stocking, Project Manager

Analytical Laboratory - ALS Environmental (ALS)

Bill Carey, Project Manager

1.2 PROJECT SEQUENCE

The removal of CCR material and coal were performed concurrently, with the removal of coal and coal contaminated soil material detailed in the *James DeYoung Power Plant Coal Yard Closure Certification Report,* prepared under separate cover. Additionally, partial removal of CCR materials used as a leveling/base layer in the construction of a former gravel parking/work area and used historically as pipe backfill east of the impoundment area was completed concurrently with the impoundment closure. Removal of these materials are discussed briefly in Section 8.0 of this report. A majority of the tasks overlapped subsequent tasks; however, the following construction sequence was generally followed:

1. Excavation of CCR material not requiring dewatering of the work area;
2. Removal of monitoring wells located within CCR area boundaries;
3. Dewatering and excavation of the CCR material contained within the three impoundments;
4. Verification of CCR material removal through visual observation, microscopy evaluation, survey, and metals testing;
5. Disposal of CCR material via truck transportation to Ottawa County Farms Landfill in Coopersville, Michigan;
6. Placement of sand backfill;
7. Placement of topsoil layer;

8. Installation of new fence and monitoring wells;
9. Final grading of approved and surrounding areas; and
10. Placement of seed and mulch over disturbed areas.

1.3 REFERENCES

The following references were utilized by the field engineering personnel as part of the Construction Quality Assurance (CQA) management of this project:

1. Part 257 of Title 40, Protection of Environment, of the Code of Federal Regulations
2. Part 115 of the Natural Resources Protection Act, 1994, PA 451, as amended.
3. Closure Plan, CCR Surface Impoundment System, James DeYoung Power Plant, October 17, 2016, prepared by NTH Consultants.
4. Coal Impoundment System Closure Plan – Coal Removal Visual Documentation Procedure, Revision 1, NTH Consultants, August 10, 2017 (Visual Documentation Procedure) prepared by E&E Solutions and NTH.
5. James DeYoung Power Plant Coal Pile and CCR Surface Impoundment Systems Closures, Issued for Construction Documents, dated August 2017, prepared by E&E Solutions.
6. CCR Surface Impoundment – Supplemental CCR Removal Documentation Procedure – April 10, 2018, prepared by E&E Solutions and NTH.

1.4 PURPOSE AND SCOPE

This certification report is based on the observations and measurements made by personnel during the course of construction, including review of data provided to E&E Solutions and NTH. The purpose of this document is to present documentation of observations, measurements, and data in accordance with the project documents noted in Section 1.3.

Throughout the duration of the project, the field CQA personnel observed and documented construction progress, performed visual observations of CCR removal, completed elevation survey in removal areas, arranged analytical testing of samples to confirm CCR removal, and arranged testing of soil materials used for backfill. The construction verification documented in this report includes:

1. Field reports detailing construction activities, weather conditions, testing performed, and samples taken during each visit by the Field engineer;
2. Quality conformance sampling and testing of the backfill and topsoil used in construction;
3. On-site visual observations to verify CCR material removal;
4. Sampling and analytical testing at 25 percent of the verification points located within the CCR area to verify concentrations in underlying soils achieve the requirements of the Closure Plan and project specifications;
5. Microscope confirmation of underlying soils samples that appear gray in color to visually verify less than 5 percent CCR materials are present;
6. Testing of structural fill for in-place density and moisture content; and
7. Documentation of site grades and construction quantities.

2.0 CONSTRUCTION VERIFICATION

CQA personnel implemented verification procedures to document removal of CCR materials from the current and historical surface impoundment and ash handling areas, and restoration in accordance with the reference documents noted in Section 1.3. Responsibilities and necessary documentation is provided in the following sections.

2.1 CQA FIELD OFFICER

The CQA Field Officer is a Professional Engineer licensed in the State of Michigan and experienced in the fields of geotechnical engineering, earthwork and site remediation. The CQA Field Officer was selected by the Owner and was responsible for the implementation of the requirements of the Construction Documents and certifying that construction is as described in this document.

The CQA Field Officer was responsible for:

- Managing field CQA personnel, periodic observation of the site and construction activities, and reviewing logs, test data, and other documentation;
- Approval of materials being used for construction;
- Selection of third-party material testing laboratories; and
- Certification of construction in accordance with the Project Documents.

2.2 CQA FIELD ENGINEER

The CQA Field Engineer was the person, or persons, responsible for the observation of construction activities, performing necessary tests and measurements, and developing documentation of the CCR removal and site restoration. The CQA Field Engineer periodically visited the construction site when active construction was being performed and maintained a log of site activities during each visit. The CQA Field Engineer was responsible for the sampling, testing, and documentation of CCR removal, and restoration activities.

The CQA Field Engineer is knowledgeable in the construction and testing techniques employed for the stage of construction being completed. The CQA Field Engineer was responsible for performing the required field observation and testing, including visual verification of soil removal, GPS surveys, density testing, grain size distribution and soil classification tests.

The CQA Field Engineer was responsible for reporting non-conformance of construction activities to the CQA Field Officer, the Construction Contractor and the Owner or his authorized representative and documenting repairs and deviations from the original design.

2.3 DOCUMENTATION

2.3.1 Field and Photograph Reports

The cornerstone of the documentation is the collection of field reports and photographs, prepared by field personnel. These reports summarize verification and construction activities during each site visit. Field reports are provided in Appendix A and document the following:

- Date and time of visit;
- Weather conditions;
- Personnel on-site;
- Construction activities including equipment used and materials placed; and
- CQA activities, including material sampling and testing, point inspection, and observation and testing activities.

The CQA Field Engineer prepared photograph reports to document CCR removal at the specified grid nodes as excavation activities progressed. The reports are included after the daily field reports, in Appendix B.1.

2.3.2 Construction Plans

Field personnel utilized site construction plans to show approximate grading limits, demolition requirements, locations of samples taken, tests performed, and defects found during construction inspections. The CQA Field engineer completed surveying using a Leica Smart Station GPS, model RX1200 as necessary to verify grades, document testing locations and in-place material thickness. The construction plans are at an appropriate scale in order to show the recorded information clearly and have been updated to reflect "as-constructed" records. "For record" construction drawings are included in Appendix F.

3.0 CCR REMOVAL

Ryan Inc. completed closure of the CCR surface impoundment / ash handling areas. The methods and progression of CCR material excavation are presented in the following paragraphs followed by a description of dewatering, dust, and erosion and sedimentation control necessary to support construction. Also presented is a description of supplemental work completed concurrently with CCR excavation including fence and monitoring well removal and replacement, pipe removal, and demolition of a concrete wall.

3.1 EXCAVATION AND CONSTRUCTION ACTIVITIES

3.1.1 Removal of Accessible CCR Material

Prior to dewatering of the surface impoundments, Ryan removed accessible CCR material using a dozer, excavator and skidsteer. Removal began in the CCR surface impoundment area in the southwestern portion of the site and proceeded easterly, then northerly, continuing concurrently with, or following, removal of overlying usable coal and adjacent coal soil mixtures. The excavated material was pushed using a dozer into or transferred using a loader and the skid steer to stockpiles located near the paved roads to await removal from the site. Care was taken to prevent CCR materials from becoming mixed with underlying soils, adjacent coal/soil, and to

prevent tracking of material to unimpacted areas of the site. Ryan concurrently removed the accessible CCR material adjacent to the existing surface impoundments with, or immediately after, the materials were removed from the surface impoundments.

Removal activities continued until natural soils were encountered and lab/field data collected by the CQA Field Engineer indicated that CCR removal goals had been achieved. These results are presented in later sections of this report.

3.1.2 Excavation of CCR Material in the Impoundment Ponds

Following dewatering of the impoundments, Ryan removed the remaining CCR material located within the three surface impoundments. Ryan removed the materials using an excavator and dozer to push the material up the slope and onto the adjacent surface where the material was allowed to decant. Once sufficiently drained, the material was stockpiled adjacent to the pavement to await removal from the site.

Removal activities continued until natural soils were encountered and data collected by the CQA Field Engineer indicated that CCR removal goals had been achieved. These results are presented in later sections of this report. Natural soils encountered in the vicinity of the surface impoundments were generally a brown or gray sandy silt, often with shells present.

3.1.3 Disposal of CCR Material

Ryan used a loader to load the excavated CCR materials onto trucks to haul it to the off-site, licensed disposal facility. The trucks did not leave the adjacent concrete paved areas during loading to prevent track-out of impacted materials to other areas of the site. The total amount of CCR materials removed from the site and delivered to the Ottawa County Farms Landfill in Coopersville, Michigan was approximately 47,500 tons.

3.2 SITE DRAINAGE AND DEWATERING

Initial pumping of ponded storm water occurred on an as-needed basis to allow the excavation of accessible CCR material; this is documented in the CQA Field Engineer's reports in Appendix A. Ryan prevented storm water that contacted CCR materials from leaving the CCR areas and directed it towards the existing CCR surface impoundments. During initial excavation of accessible CCR materials, ponded groundwater and storm water encountered in large quantities was pumped into the first surface impoundment, and care was taken to ensure that potentially contaminated material was only discharged to the CCR surface impoundments. Water was then allowed to drain through the surface impoundments, being sampled and discharged from outfall 001 in accordance with the site's National Pollutant Discharge Elimination System (NPDES) Permit No. MI0001473.

The removal of CCR material contained in the surface impoundments was completed following the removal of the majority of the shallow CCR material. The impoundments were dewatered by the installation and operation of well points at approximately three to five-foot intervals. The well points were temporarily installed around the perimeter of the anticipated

surface impoundment / ash handling areas using auger or hydraulic jet methods to a level below the lowest level of the surface impoundment floors. Sufficient water was pumped from the well points using several vacuum pumps to lower the groundwater levels to below the floor of the surface impoundments allowing CCR material to be excavated. The removed groundwater was directed through a header system to three (3) settling tanks to allow removal of sediments prior to discharge. Discharge monitoring reports documenting the sample results and discharge amounts were documented in compliance with the NPDES Permit during excavation activities.

3.3 FUGITIVE DUST CONTROL

Ryan Inc. implemented fugitive dust control measures to control fugitive emissions from the ash handling areas. Fugitive dust control measures complied with project specifications and the HBPW Fugitive Dust Control Plan for JDY Ash Pond System.

Water application was the keystone of fugitive dust control. If noticeable amounts of dust and particulates became present during excavation, measures were taken to prevent dispersion by applying water to the area via tank trucks equipped to apply water uniformly, in controlled quantities, and able to adjust to a variable width surface.

To control fugitive dust resulting from transport, Ryan Inc. swept all paved roads daily with a skidsteer mounted sweeper to prevent particles from being tracked off-site. On-site roads were also treated with water to minimize fugitive dust. Trucks were loaded such that CCR material did not come within 6 inches of the top of the truck bed sideboards. Tarps were used to cover all loaded trucks (both incoming sand and topsoil and outgoing CCR materials).

The project site experienced precipitation - either rain or snow - frequently enough that water application by means of tank trucks was rarely necessary. Both excavation and the transportation of CCR material was suspended when average wind speeds exceeded 25 mph.

3.4 EROSION CONTROL

Ryan installed and maintained erosion and sedimentation controls in accordance with the approved SESC plan and the construction documents. Erosion measures in the CCR area included the use of rip rap, sediment tubes, silt fences and a diversion berm. The Construction Storm Water Management Operator regularly inspected the erosion controls and maintained records as necessary throughout the project.

3.5 MONITORING WELL REMOVAL

Two of the pre-existing groundwater monitoring wells, MW-2A and MW-3, were located within CCR impoundment area boundaries. It was necessary to remove the wells to ensure removal of CCR material and subsequent backfilling of the site. The wells were removed using an excavator, and to prevent the leaching of water from the site, bentonite was poured into the remaining well holes. Prior to filling the holes, the CQA Field engineer visually inspected the locations to confirm that CCR removal met project specifications. The locations of these wells are shown on

Sheet V-001 in Appendix E. Replacement monitoring wells are documented in the Groundwater Sampling and Analysis Plan and Annual Groundwater Monitoring reports for the facility, under separate cover.

3.6 RELATED SITE CONSTRUCTION ACTIVITIES

3.6.1 Pipe Work

Construction plans called for various existing subsurface pipes on-site to either be removed or left in-place depending on site requirements. During excavation, Ryan removed the 24-inch discharge pipe from Pond 3 to the pipeline leading to NPDES Outfall # 1. The pipe was in poor condition and would not be required following closure of the CCR ponds. A storm water inlet was installed where the pipe originally entered a manhole connecting it to the storm line leading to Outfall #1.

Ryan removed an abandoned 24-inch dredge pipe and 20-inch snow melt pipe that passed though the north end of the excavation area. End caps were installed on the exposed pipe ends left in-place at the limits of excavation. A manhole near the center of the snow melt pipe was excavated with a hydraulic excavator, the area was visually inspected for removal of CCR/coal materials and backfilled with clean sand. Ryan removed the pipes with a hydraulic excavator and EES visually observed the resulting trench to confirm removal of coal materials before Ryan backfilled the excavations with clean sand.

Other pipe work included the installation of a gate valve to cap an abandoned pipe, located along the northern edge of the CCR impoundment area, closest to the James DeYoung Power Plant building.

3.6.2 Fence Removal and Replacement

Ryan removed the fence along the south end of the property during construction, as it was located within the CCR area's boundary. Removal of the fence allowed the CCR material in this area to be excavated thoroughly, and the area to be visually reviewed to ensure CCR removal met design and specification requirements. The fence was replaced after completion of removal during site restoration.

3.6.3 Concrete Weir and Wall Removal

Ryan removed the concrete weir located at the discharge from the last surface impoundment by first excavating CCR materials from within the weir box. Next, the concrete walls were demolished using a wrecking ball attachment on an excavator to approximately 3 feet below grade and the excavation was filled with granular fill up to existing grade. Ryan also removed a concrete wall separating the coal yard from the CCR surface impoundment area using an excavator.

4.0 SITE RESTORATION

4.1 PLACEMENT OF GRANULAR FILL AND TOPSOIL

Upon verification of CCR material removal, EES staked off the approved area in order to prevent worksite vehicles from tracking contaminated soils back into the area. Ryan then covered the area with a sand layer up to 12 inches using a GPS assisted D6 Bulldozer. In areas of limited access, the excavator was used to place and compact the sand.

In areas where groundwater was encountered or where excavation continued below groundwater level, Ryan placed the fill sand in a single lift up to 12 inches to bring the grade above groundwater level. Sand fill was then placed in regular lifts and compacted as described above.

Once an area was approved and covered with clean backfill, Ryan placed a 4-inch thick (minimum) layer of topsoil for vegetative growth over the sand backfill using the GPS assisted D6 dozer. Final grading of the topsoil layer is at a tolerance of plus 0.20 foot from approved grade.

4.2 SEEDING AND FERTILIZER PLACEMENT

The topsoil layer was seeded, fertilized and mulched to establish vegetation. Ryan mixed a fertilizer, consisting of a Nitrogen – Phosphorus – Potassium ratio of 19-19-19, thoroughly into the upper 2 inches of topsoil. Mulching was done per the requirements outlined in MDOT 816.03(E) utilizing a high velocity mulch blanket per MDOT 816.03 and MDOT 917.15. Seed, provided by Evergreen Seed Supply was required to have a germination rate of not less than 80-percent, with the mixture and percent of seed as listed below.

Seed Variety	**Percent of Seed**
1. Perennial Rye Grass	50%
2. Kentucky Blue Grass	15%
3. Creeping Red Fescue Grass	35%

5.0 CONSTRUCTION VERIFICATION

EES completed construction quality assurance activities throughout the project to verify that CCR materials were sufficiently removed and that the site was restored to a smooth even grade capable of supporting vegetation.

5.1 VERIFICATION OF CCR REMOVAL

EES documented removal of the CCR materials by a process that relied on visual verification and surveying of the CCR material excavation. The process for verification of the removal of CCR material was developed from the requirements in the *CCR Impoundment System Closure Plan – CCR Removal Visual Documentation Procedure, Revision 1*, NTH Consultants, August 10, 2017 (Visual Documentation Procedure). This document required that CCR material removal be documented at grid interval verification points developed for the site based on the methods

described in *Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria, 2002,* Michigan Department of Environmental Quality's (S3TM document).

A grid interval with an approximate spacing of 33.33 feet was developed based on guidance in the S3TM document and was superimposed over the entire CCR material excavation area. Site construction plans were utilized to show the locations of verification points, samples taken, tests performed, and deviations from approved design plans. All inspection locations are referenced to the site coordinate system, shown on a copy of the construction site plan in Appendix B.1. The excavation areas were divided into the coal yard and the CCR removal areas: Points 196 and 4001-4181 represent the CCR surface impoundment system or CCR handling areas. The CCR handling areas include areas where CCR materials were observed to be present in underlying soils.

EES surveyed the verification points before and after CCR material removal, using the Leica GPS to determine location and elevation. EES tabulated survey data and generated a topographic map of each surface as evidence of removal (Sheets C-101 and C-102 of the Construction Record Drawings in Appendix F).

Once a verification point was located and prior to backfill, EES visually observed and documented the area to verify CCR removal to a *de minimus* level of 5 percent CCR material/ 95 percent soil. Prior to individual verification point inspections or sampling, the CQA Field Engineer walked the general CCR area surrounding the points ready for verification. A location with observable CCR material remaining was further excavated by Ryan Inc., under the observation of the CQA Field Engineer. Following this overall inspection, verification points were located individually using the Leica GPS. A one square foot grid frame was used and a photo taken from a standard height of 1.5 feet at each verification point. The grid frame assisted in providing a visual confirmation that residual CCR material was not present in the area within the grid frame. If CCR material was found to be visually present at greater than 5 percent within the grid frame, the area in the vicinity of the verification point was further excavated prior to repeating the visual assessment and verification. EES documented observations and a description of the soil at each verification point, consistent with ASTM D 2488 for visual manual description of soils.

Soil descriptions included color, secondary texture, basic texture, supplementary textures, and other comments. The color of the natural soils on site were light to dark brown, light to dark gray, or orange. The basic texture of the natural soils was sand, and the secondary texture was silty. The secondary texture was present in over 30 percent of the grid area, but still less than the basic constituent. Supplementary textures included minor constituents, described as trace (1 to 15 percent), little (15 to 30 percent), or some (30 to 50 percent). Supplementary textures observed on site included gravel, clay, and peat. Other comments included the observation of roots, sticks, or shells. A verification picture of the grid with the point number included was taken at a minimum of 50 percent of the grid nodes as part of the documentation of CCR removal. These observations and pictures are located in Appendix B.1.

In some cases, the color contrast between the dark gray to black colored ash and the underlying native subsoil was insufficient to photographically document a difference. Where the visual inspection did not offer significant contrast between the dark gray to black ash residuals and the underlying soil, a supplemental line of evidence included examination for the presence of thin dark gray to black organic laminations and/or the presence of peat layers in the underlying native soil. After collecting the grid photograph, a flat spade shovel was used to remove a cube of soil to show the soil profile of the underlying native soils. Where this line of evidence was used, a photograph of the soil profile was taken (Appendix B.1). The presence of undisturbed lamination and peat layers indicate that the underlying soil is native soil, and no ash is present, as the native soil was deposited prior to ash being deposited, based on the law of superposition. In some locations, however, the underlying native soils consist of more clayey and/or sandy layers and may not exhibit the same depositional laminations. In these cases, grain size and texture were the main indicators of natural soil, and a microscope evaluation was performed, as described below.

5.1.1 Microscope Evaluation

The natural sand and soils present on site were largely brown-gray in color, varying from light to dark. As a result, it was sometimes difficult to distinguish the underlying soils from CCR material in the documentation photographs taken. As the project progressed this issue was discussed with MDEQ Grand Rapids District staff and the verification was modified to include the microscopic evaluation of some samples as presented in the *CCR Surface Impoundments – Supplemental CCR Removal Documentation Procedure, April 10, 2018 Final,* prepared by NTH (Supplemental CCR Removal Documentation Procedure), a copy of which is provided in Appendix E.

The soil was further observed at these locations using a microscope to distinguish CCR material from sand, silt or organic soils at a magnification of 400X. Where EES observed more than 5 percent of CCR material present, Ryan further excavated the areas and the location was retested. These pictures are located in Appendix B.1.1.

5.2 CONSTITUENT ANALYSIS

A portion of the CCR area verification points were sampled and evaluated for the presence of indicator parameters typically found in CCR materials (total concentrations of metals, sulfate, fluoride, and chloride, and Radium 226 and 228 combined). As the project continued and several of the indicator parameters were not found to be elevated in underlying soil samples collected at the site, the list was reduced as documented in the Supplemental CCR Removal Documentation Procedure to include only the following constituents:

1. Metals including mercury, arsenic barium, beryllium, boron, cadmium, lead, lithium, molybdenum, and selenium, and
2. Sulfate

The verification point locations where samples were selected for analyses were identified by means of a random number generator. Each CCR area verification point number was entered into a random number generator, and at least 25 percent of the points were randomly chosen for sampling. Extra points were then added in locations that lacked a nearby testing point, to ensure that the entire CCR area was represented in the samples taken.

The CQA Field Engineer collected samples after visual inspection had taken place and filled sample jars, provided by ALS, with a representative sample from the selected verification points, labeled with the following information:

- Sample identification number (inclusive of the appropriate verification point number;
- Sampling date;
- Sampling time; and
- CQA Field Engineer's initials.

Care was taken to ensure that the sample stayed at or below 35 degrees Fahrenheit by keeping all sample jars (used and un-used) in a cooler filled with ice packs, until delivery to ALS. If the samples were not delivered on the day taken, they were kept refrigerated overnight until delivery the next morning. ALS completed the analysis and the results were compared to Michigan's Part 201 cleanup criteria for soil.

The applicable compliance standards include the statewide default background level, regional background concentrations (as indicated in the Michigan Background Soil Survey, updated 2015), and soil groundwater surface water interface protection criteria (GSIP). Soil GSIP criteria was chosen as the appropriate groundwater protection criteria because groundwater discharges to Lake Macatawa at the site's western boundary and is not used regionally as a drinking water source.

If total levels of a constituent were found to be in excess of the higher of the applicable standards, but below direct contact criteria at a specific location, this sample was further analyzed using the Synthetic Precipitation Leaching Procedure (SPLP) testing for the exceeding parameter and evaluated for compliance with applicable drinking water or GSIP criteria. Parameters encountered occasionally requiring the SPLP procedure to be completed included arsenic, barium, cadmium, cobalt, lithium, mercury, and selenium. Most commonly, a SPLP test was performed on samples for arsenic, lithium, mercury, and/or selenium. SPLP tests were performed by ALS at the request of the CQA Field Officer or CQA Field Engineer. The use of testing for SPLP was occasionally reduced once total concentrations that produced passing SPLP results were established.

When analytical results for the sampled points did not meet the described criteria, the area represented by the verification point, Ryan further excavated the area and EES re-sampled the location prior to approval. Summary tables of analytical results with comparison to cleanup criteria and laboratory results are presented in Appendix C.

5.3 GRANULAR FILL TESTING AND APPROVAL

EES evaluated the granular fill to confirm that it was from an uncontaminated source prior to delivery to the site. The CQA Field Engineer collected four representative grab samples from a pit located on the North side of Croswell St, East of 152nd Ave in West Olive, Michigan and delivered them to ALS for analysis of MI-10 metals. The analytical results indicated that concentrations of all metals were found to be within allowable background concentrations. The results are summarized and provided in Appendix D.1.1.

Material testing of the structural fill included performing a Modified Proctor Moisture Content-Density Relationship Test (ASTM D1557) and performing a sieve analysis (ASTM D422-63) periodically as material was delivered to the site. The CQA Field Engineer completed testing at a rate of one test per 5,000 cubic yards of material placed, or as material source changed. Driesenga performed Modified Proctor Tests while sieve analyses were performed by the CQA Field Engineer. In total, four Modified Proctor tests and four grain distributions were performed on the approximate 15,000 cubic yards of subgrade fill placed across the CCR area. Test results are located in Appendix D.1.2.

The CQA Field Engineer was responsible for observing the placement of granular fill and verifying that lift thickness and compaction was performed in accordance with project specifications. The CQA Field Engineer conducted field density and water content tests (ASTM D6938) to check the degree of compaction achieved using a nuclear density gauge. For field density and moisture content testing, a frequency of one set (three tests) per acre, per lift, per day was required to verify that backfill was compacted to at least 90 percent of its maximum dry density. Testing locations were randomly selected to ensure an even distribution across the site. Test results are located in Appendix D.1.3. Field density testing locations are referenced to the site coordinate system, shown on a copy of the construction site plan in Appendix B.2.

Maximum Dry Density values used during density testing were 107.5 pounds per cubic foot (PCF), 110 PCF, and 111 PCF. The Maximum Dry Density result of 108.0 PCF from May 9, 2018 was disregarded as it was the lower value of the two modified proctor results received from Driesenga on that day.

In total, the CQA Field Engineer conducted 15 tests to verify that backfill was compacted to at least 90 percent of its maximum dry density on the first lift placed in the 4.3-acre CCR area. The former CCR surface impoundment ponds were the only portion of the CCR area requiring more than one lift of backfill. Ponds one and two each had three lifts of backfill placed, and pond three had four lifts of backfill placed. The number of tests per lift per day are summarized in the table below. All density tests performed on the lifts of backfill placed in the CCR area observed a compaction of 90 percent or greater.

		CCR Backfill Density Test Summary Table								
		5/3/18	5/4/18	5/7/18	5/8/18	5/9/18	5/10/18	6/1/18	Total	Location
Tests per lift	Lift 1	5	5	3	-	-	-	2	15	CCR Area, Pond 1-3
	Lift 2	-	4	4	-	-	-	-	8	Pond 1-3
	Lift 3	-	-	-	4	2	2	-	8	Pond 1-3
	Lift 4	-	-	-	-	2	3	-	5	Pond 3

5.4 TOPSOIL TESTING AND APPROVAL

Approval of the topsoil source was based on conformance of the borrow source properties with design specifications. The project documents required the topsoil to be: locally available, natural topsoil, and free of contamination, ash, cinders, tree roots, and large stones. Analytical test results for samples collected from the various topsoil sources are located in Appendix D.2.

Topsoil used in construction came from the Lakeshore Sand Pit located on the South side of Perry St, ¼ of a mile east of 40th St in Ottawa County, Michigan. Prior to transportation to the site, five representative samples (TS-1 through TS-5) were collected by the CQA Field Engineer and delivered to ALS for testing. The first four of these samples were tested for the presence of MI-10 metals, and TS-5 was tested for pH and organic content. The source was verified to have metals concentrations consistent with background values, have an organic content above 2.5%, and a pH between 6.4 and 7.5, as required by the construction documents.

Topsoil samples TS-6 through TS-10 were collected from a second source, Brewer's Ready Mix Plant, at 3246 80th Avenue in Zeeland, MI. TS-6 through TS-9 were tested for the presence of MI-10 metals, and TS-10 was tested for pH and organic content. After laboratory results were compared to Part 201 Generic Cleanup Criteria, samples TS-6 through TS-9 were found to exceed certain Statewide Default Background Levels Criteria, and sample TS-10 did not meet the pH requirement. Therefore, the material from the 80th Avenue stockpiles was not used in the construction.

The CQA Field Engineer surveyed the site at each verification point following completion of granular fill and topsoil placement to document finished grade and to verify the amount of granular and topsoil materials placed were consistent with project specifications. Thickness of the topsoil was verified by the CQA Field Engineer with a spot check and shovel at each verification point to ensure that a 4-inch minimum topsoil thickness was achieved. Once seeding was completed, a site walk was performed to verify all areas were seeded.

6.0 MONITORING WELL INSTALLATION

Three new monitoring wells were installed at the James DeYoung Power Plant property; two were located within the former CCR area (MW-1 and MW-2), and one was located within the former coal yard area (MW-3). Wells were installed by West Michigan Drilling under the observation of NTH on November 27th and 28th, 2017.

Each well was constructed after coal and/or CCR materials had been removed from their respective locations and the areas had been approved for backfill by the CQA Field Engineer. Locations and survey information are located in Appendix F on Sheet C-102. Details of the installation and relevant testing information will be included in Annual Groundwater Reports for the site, under separate cover.

7.0 MDEQ CORRESPONDENCE

During the course of the project it was necessary to review project methods with representatives from the MDEQ Grand Rapids District Office. This occurred midway through the project when it was determined that the natural sand and soils present on site were largely brown gray in color, varying from light to dark. As a result, it was sometimes difficult to distinguish the underlying soils from CCR material in the documentation photographs taken. The previously approved verification procedure was clarified and modified to include the microscopic evaluation of some samples. The modified procedure, prepared by NTH Consultants, Ltd. was transmitted to MDEQ in a letter from the HBPW dated April 23, 2018: *CCR Surface Impoundment – Supplemental CCR Removal Documentation Procedure, April 10, 2018 Final*. A copy of this procedure is included in Appendix E.

8.0 DEPARTURES FROM APPROVED DESIGN PLANS

Several departures from the original design drawings (Appendix F) and specifications were necessary due to the nature of field conditions encountered during construction activities. Prior to incorporation into construction, these departures were reviewed and approved by the CQA Field Officer, and when appropriate, by representatives of the MDEQ.

1. Design plans for the James DeYoung Power Plant Coal Pile and CCR Surface Impoundment System Closures called for field verification of the limits of the coal/soil mix during construction.

   Based on field observations, coal and coal-soil material, with no CCRs present, were found to the west of the existing perimeter fence, as well as in the southwest corner of the site.

   Field observations also indicated CCR materials associated with historical impoundment operation were more extensive than originally anticipated. These areas were subsequently addressed and the extent is documented on the attached construction record drawings (Appendix F) and on the grid-map contained in Appendix B.1.

2. During excavation of the coal/soil mixture, several areas along the southern perimeter of the coal yard and around verification Point 196 were found to be underlain with CCR materials. These areas were removed from the coal pile restoration area and were addressed as part of the CCR surface impoundment/ash handling area closure, as documented in this report.

3. Final grades were adjusted to limit the amount of backfill materials required. The as-designed final grading plans were based on the assumption that the coal present in the coal/soil mixture was inert and would not be required to be removed; however, as a result of regulatory requirements, this coal/soil mixture was required to be removed during construction.

4. Only a portion of the 24-inch discharge pipe running from the CCR ponds to NPDES Outfall #1 was to be removed and a storm water collection inlet placed. Additional quantities of the piping were removed than originally planned due to the poor condition of the pipe. The storm water inlet location was moved to accommodate this change.

5. The CCR Surface Impoundment – Supplemental CCR Removal Documentation Procedure was updated on April 10, 2018 with approval by the MDEQ, to provide a reduction in the constituents analyzed for confirmatory soil samples to match those being found at the site. Changes to the procedure included updates to the one square foot grid used in the verification survey pictures. The grid was originally divided into 100 squares by several wires. The squares were intended to help visualize the 5 percent *de minimus* goal but hindered the visualization of the underlying soils in the CCR area.

   Another change to the procedure included the addition of the supplemental line of evidence by means of microscope evaluation. This step was added to further evaluate and confirm natural silty materials were present in the case that the color contrast between the dark gray/black colored ash and the underlying native subsoil was insufficient to photographically document a difference.

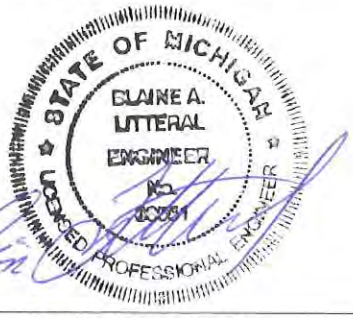
6. A parking/work pad area where historical beneficial use included a base layer of CCR material covered by geotextiles and/or gravel and pipelines backfilled with a soil/CCR material mixture was identified on the eastern portion of the site. While a large portion of this area was addressed, CCR materials remain in the vicinity of the active snowmelt lines along the eastern portion of the site. For this area where residual amounts of beneficially used CCR material remains, a separate documentation report will be prepared to document regulatory requirements pursuant to 40 CFR Part 257.

9.0 CERTIFICATION

I, David R. Lutz and Blaine A. Litteral, Professional Engineers licensed in the State of Michigan, certify[1] that, NTH Consultants, Ltd. and E&E Solutions have reviewed the visual documentation, the survey data, and prepared this certification report for the CCR Impoundment System Closure at Holland Board of Public Works James DeYoung Power Plant in Holland, Michigan as presented above. To the best of my knowledge and belief, the information presented in this report for the CCR Impoundment System Closure at the aforementioned facility has been prepared in substantial conformance the requirements established in conformance with Part 257 of Title 40, Protection of Environment, of the Code of Federal Regulations; Part 115 of the Natural Resources Protection Act, 1994, PA 451 as amended; and the MDEQ approved CCR Removal Visual Documentation Procedure, subject to the modifications identified in this report This certification partially satisfies the requirements of 257.102(f)(3), pending groundwater closure certification to satisfy the remaining requirements of CCR closure by removal in accordance with 257.102(c).

8/31/18

David R. Lutz, P.E.
State of Michigan Professional Engineer
Registration No. 57487



Blaine Litteral, P.E.
State of Michigan Professional Engineer
Registration No. 36551

I am rendering my professional opinion based on the information available to me at the time of this report writing. This certification does not comprise a guarantee or warranty that certain conditions exist, nor does it relieve any other party of their requirements to abide by all applicable, local, state, and federal regulations, and to honor all express or customary guarantees and warranties associated with their work.[1]

APPENDIX A

FIELD AND PHOTOGRAPH REPORTS

NOTE: COAL YARD AND CCR IMPOUNDMENT AREA WORK ARE DOCUMENTED IN THE FIELD REPORTS AS THE WORK WAS PERFORMED CONCURRENTLY

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 8/25/2017

Time Arrived: 9:30 Time Left: 10:15 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 70 °F

Personnel on Site

Owners:	HBPW: Andrew Reynolds
Contractors:	Ryan Inc, Rob Koski
Contractors:	
CQA:	E&E Solutions, Mitch Stark, Kurt VanAppledorn
Other:	Pitsch Co (subcontractor to Ryan) on site for demolition of conveyor

Summary of Construction Activities

Beginning to excavate CCR from south and east, and stockpiling it up to be hauled away.Beginning removal of conveyor by Pitsch. Pitsch started to cut away sections of conveyor and work on inside area.

Summary of CQA Activities

Site observation, survey of drone targets and Ryan's control points. Kurt flew the drone and collected aerial images of the site.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 8/28/2017

Time Arrived: 2:00 Time Left: 3:45 Page: 1 of 1

Weather: cloudy Precipitation: slight rain in morning Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Blaine Litteral, Mitch Stark
Other: Pitsch

Summary of Construction Activities

Continuing to excavate CCR area and coal yard, and stockpile for disposal. Pitsch continued the removal of the conveyor. Part of the storm pipe running north/south on southwest of site was uncovered and found to be corroded and damaged. RFI #1 was created to deal with this issue.

Summary of CQA Activities

Surveyed manholes and pipe that was uncovered, more grid points to use for volume comparison.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 8/29/2017

Time Arrived: 3:50 Time Left: 4:20 Page: 1 of 1

Weather: clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Pitsch

Summary of Construction Activities

Continuing to excavate and stockpile coal and CCR, and create separate piles for each. Pitsch continued removing conveyor parts. Uncovered more of storm water pipe and manhole in southwest of site that was found yesterday for further inspection. Hauling of materials to landfills to begin tomorrow. Reminder to crew that dust control must be done when trucks arrive. They will spray down the coal road to avoid dust.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/5/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:	Jane Monroe, Andrew Reynolds, Theo VanAken, Fred Heiser
Contractors:	Ryan Inc
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	Pitsch Co.

Summary of Construction Activities

Most of the ash has been excavated from pond 1 area. Continuing to pile CCR and CCR/soil mix as well as coal from yard and ponds. CCR material trucked to Ottawa County Farms Landfill and coal material to Zeeland Township Landfill. Conveyor pieces still being removed and disposed.

Summary of CQA Activities

Site visit and observation of coal and CCR areas.

Notes:

Weekly progress meeting occurred.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/6/2017

Time Arrived: 4:00 Time Left: 4:30 Page: 1 of 1

Weather: clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc, Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Pitsch

Summary of Construction Activities

Continuing to excavate and stockpile CCR and coal, and hauling to Coopersville landfill and Zeeland landfill. Pitsch continuing to remove conveyor pieces and concrete.

Summary of CQA Activities

Site visit and observation of coal and ash areas.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/8/2017

Time Arrived: 4:00 Time Left: 4:30 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Pitsch

Summary of Construction Activities

Continuing to excavate, stockpile and haul CCR and coal. Conveyor parts and concrete removal ongoing by Pitsch. Building near ponds was demolished and disposed.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/11/2017

Time Arrived: 10:00 Time Left: 11:15 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 65 °F

Personnel on Site

Owners:	Jane Monroe, Andrew Reynolds, Theo VanAken, Fred Heiser
Contractors:	Ryan Inc., Rob Koski
Contractors:	
CQA:	E&E Solutions, Blaine Litteral
Other:	

Summary of Construction Activities

Continuing to haul CCR and coal. Approx. 35 loads of CCR to Ottawa County Farms Landfill and 5 loads to Zeeland Landfill. Stripped nearly all of pond 1 of surrounding vegetation. Monitoring well 3, in between ponds 1 and 2, and found to be in several feet of ash, to be removed this week.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Weekly progress meeting occurred.

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/12/2017

Time Arrived: 4:15 Time Left: 4:45 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc.
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Pitsch

Summary of Construction Activities

No hauling today, continuing to stockpile CCR. Continuing to break up concrete from conveyor, and remove material for disposal. Screened coal pile was moved from south end and joined with coal pile on North end. Monitoring well MW-3 was removed, and filled with bentonite.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/13/2017

Time Arrived: 3:30 Time Left: 4:15 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:	Andrew Reynolds
Contractors:	Ryan Inc.
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	Pitsch

Summary of Construction Activities

Stockpiling CCR material into one large pile where screened pile used to be. While pitsch was removing concrete, a 48" steel storm water pipe was damaged and began leaking. It was filled by Ryan with a 4x4 block of wood and surrounded by hydraulic cement. RFI will be made to inquire about a longer term solution.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/13/2017

MW-3 after removal

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/15/2017

Time Arrived: 1:30 Time Left: 2:30 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark, Kurt VanAppledorn
Other:

Summary of Construction Activities

Continuing to stockpile CCR material and haul to Coopersville. Some coal will be transported to Zeeland at the end of the day if time available. Reminded Ryan crew to keep spraying and sweeping coal roads for dust prevention.

Summary of CQA Activities

Site visit and observation of construction activities. Tested south border along fence to see if coal/ash extends into the Padnos property.

Notes:

The coal/ash extends about 1.5 feet past the fence towards Padnos, which could be HBPW property. The property line has not been determined by a professional surveyor. Plan to speak with Padnos to discuss removing the fence to clean up the area.

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

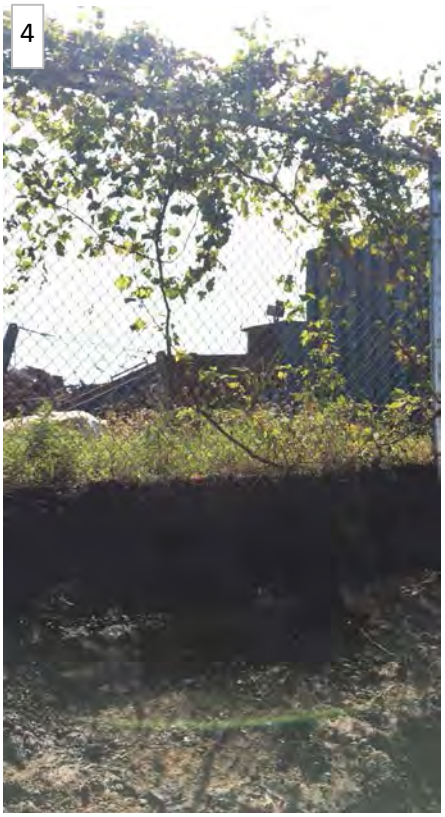
Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/15/2017

1

2

3

4



5

1. CCR Pile on south end
2. CCR Pile on north end
3. Sand placed over concrete on pipe patch
4. Fence line soil profile, south fence
5. auto fluff found along south fence

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/18/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:	Andrew Reynolds, Theo VanAken
Contractors:	Ryan Inc., Rob Koski
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	

Summary of Construction Activities

Found 9 unused, buried culverts, 8' long, in the ground that were removed and disposed of at the landfill. The corrugated metal storm water pipe running east to west along the south border was removed, including the connecting section running north to the manhole that was previously uncovered. Metal was disposed. CCR was stockpiled and hauled.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

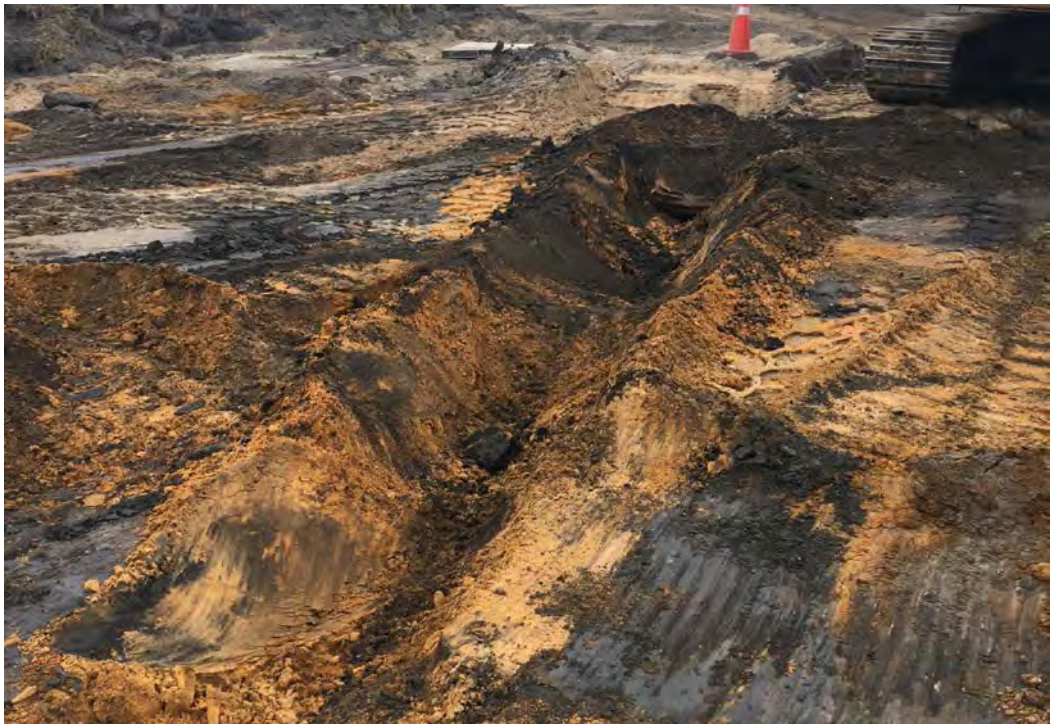
Weekly progress meeting occurred. Notes-
- HBPW to discuss with Padnos about fence removal in order to excavate coal in that area,
- Need approval on fill sand so it can be stockpiled,
- Keep running CCR to Coopersville and coal to Zeeland if there is time.
- Hopefully have results back on coal pile for sale by the end of the week.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/18/2017



Metal storm pipe being removed on west side of coal yard

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/19/2017

Time Arrived: 4:45 Time Left: 5:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 80 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark.
Other:

Summary of Construction Activities

Continued to haul CCR material and coal. Finished removal of storm pipes from yesterday. Planning on filling in conveyor hole with flowable fill tomorrow to prevent gaps when filling with sand.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/20/2017

Time Arrived: 8:45 Time Left: 10:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski
Contractors:
CQA: E&E Solutions, Mitch Stark
Other: Brewer's had 3 cement trucks bringing flowable fill from Zeeland

Summary of Construction Activities

Conveyor hole filled up to floor elevation with flowable fill. 60 yards (7 trucks) of flowable fill received, and placed in the hole left from the removed conveyor. Concrete remaining around conveyor area was broken and cleaned. CCR material continued to be stockpiled and hauled to Coopersville.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/21/2017

Time Arrived: 2:30 Time Left: 3:30 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 90 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

Hauling CCR material to Coopersville. Contractor close to being done hauling material. Conveyor hole was filled with sand (from approved sand pit sampled two weeks prior) on top of flowable fill. More storm pipes were uncovered running south from the bulding, near the old conveyor area.

Summary of CQA Activities

Site visit and observation of construction activities. Field verification of Coal/CCR limit to determine the areas to be visually inspected for coal removal and the areas to be verified for CCR removal.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/21/2017

1

2

3

1. Sand being filled in hopper hole, previously filled with flowable fill.
2. Drain pipe from plant found, looking south near conveyor area
3. Concrete manhole found, near drain.

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 9/25/2017

Time Arrived: 2:00 Time Left: 2:20 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 88 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

One truck hauling CCR material to Coopersville. Found more coal material, and it was stockpiled on the southeast side of the site. More sand was delivered to place in the ditch along the south fence and to fill ponds that were created by removing CCR material. Conveyor hole now completely filled with sand.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/2/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 70 °F

Personnel on Site

Owners:	Andrew Reynolds, Theo VanAken
Contractors:	Ryan Inc., Rob Koski, operator
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	Professional Surveyor

Summary of Construction Activities

The professional surveyor came to survey the exact property line to determine placement of the fence once it is torn down and replaced. An area of CCR was found in the southeast corner of the site, and exposed to be excavated at a later time. The grass area is to be explored today to determine the extent of CCR material in the southwest direction. The 20" pipe by the ponds is to be capped.

Summary of CQA Activities

Site visit, observation of construction activities.

Notes:

Weekly progress meeting occurred. Discussed plans for screening and hauling of coal, to begin on Thursday, October 5th. Removal of fence is expected to begin along the south property line this week, and Ryan will begin to excavate coal and CCR material once the fence is removed.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/3/2017

Time Arrived: 11:30 Time Left: 1:45 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors:
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other:

Summary of Construction Activities

The screen to be used for screening of coal was delivered to the site and set up, and included another conveyor to assist in piling of the screened coal. The screen was set up, to be filled with a loader, which will drop screened coal onto the conveyor to be stockpiled.

Summary of CQA Activities

Site visit, observation of construction activities. Certification of coal and CCR removal began. I surveyed each testing point required in the area chosen for verification, and took a photo of the soil with a 1'x1' grid placed over the soil at each point (Appendix A). I then collected a sample at the required points in the historical CCR area to be tested for metals. A description of the soil at each point was included.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/3/2017

Site overview

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/4/2017

Time Arrived: 11:45 Time Left: 3:00 Page: 1 of 1

Weather: cloudy Precipitation: slight rain Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors: Brewers
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

Brewers was placing coal into the screen using a loader. The screened coal was piled on the concrete pad next to the original pile. Trucking of the coal began as well, again using the loader to dump coal into the truck. Excavation of CCR material occurred in the area surrounding Points 4068, 4069, 4070, and 4078.

Summary of CQA Activities

Site visit, observation of construction activities. Continued observation of coal and CCR removal. I surveyed each testing point required in the area chosen for observation then took a picture of the soil with a 1'x1' grid placed over the soil (Appendix A). I then collected a sample at the required points in the historical CCR area to be tested for metals. A description of the soil at each point was included.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/4/2017

Ash found near Point 196 to be removed

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/5/2017

Time Arrived: 2:00 Time Left: 2:45 Page: 1 of 1

Weather: cloudy Precipitation: none Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors: Brewers, one operator
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other: Fence Crew

Summary of Construction Activities

The fence on the south border of the property was removed, including the fence posts and concrete anchors. Ryan removed the CCR material from the area surrounding Point 196, and coal from various small points around the site that were found during observation and added them to their respective piles for disposal. Coal continued to be screened and loaded in to trucks for hauling.

Summary of CQA Activities

Site visit, observation of construction activities. Collected two CCR samples (4068 and 4078) for analytical testing.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/6/2017

Time Arrived: 11:00 Time Left: 11:15 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 75 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, operator
Contractors: Brewers, one operator
CQA: E&E Solutions, Mitch Stark
Other:

Summary of Construction Activities

With the south fence removed, Ryan began to excavate the coal and CCR material from the property line. Coal continued to be screened and loaded in to trucks for hauling.

Summary of CQA Activities

Site visit, observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/9/2017

Time Arrived: 10:00 Time Left: 12:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 72 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

East of the existing access road, just south of the site entrance, Rob demonstrated that fly ash may be present in the berm by digging a test pit three feet deep with an excavator. At the southwest corner of the site, excavation along the property line via excavator occurred to determine where fly ash was present. Iron and other miscellaneous materials from Padnos were present in the excavated soil. Some small coal pieces were also present. At the coal material stockpile location, coal was being sorted and trucked out.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/10/2017

Time Arrived: 1:15 Time Left: 2:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 65 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors: Brewers
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other:

Summary of Construction Activities

Coal material was hauled to the Zeeland landfill, and screened coal was hauled to Morton by Brewers. Both were loaded in trucks with a loader. The area along the south border has now been excavated enough by Ryan for verification.

Summary of CQA Activities

Site visit, observation of construction activities. Verification of points 4216, 4128-29, 4130-45, 4152-61, 222-225, and 238-240 was done visually, and samples for metal testing were taken at points 4126, 4128, 4140, 4144, and 4157. The points were surveyed and photographed, and those that required samples (4144, 4128, 4157, 4140, and 4126) had a jar of the soil material collected and delivered to the lab for testing.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/10/2017

Area near south fence found to have CCR material and excavated

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/13/2017

Time Arrived: 11:15 Time Left: 1:45 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 65 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors: Brewers
CQA: E&E Solutions, Mitch Stark, Amy Mandrell, Blaine Litteral
Other:

Summary of Construction Activities

Coal was loaded into trucks with a loader and trucked off site. Ash and cinders were found to be present in the area surrounding Point 196; Ryan removed CCR material in this area via excavator until natural soils were encountered. The CCR material was stockpiled for disposal with a loader and a skidsteer. The area was excavated further with the skidsteer, then filled with sand using a loader. The loader was washed with the water truck to remove all coal and CCR debris before beginning to fill sand. The pit was filled in immediately after verification and testing to prevent it from filling in with water.

Summary of CQA Activities

Site visit, observation of construction activities. Verification of points 196-198 and 214-216 was done visually, and a sample was taken at point 196 to be tested for metals. The test points were surveyed, as was Point 196, after the CCR material was removed.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/13/2017

Excavation of area surrounding Point 196

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/16/2017

Time Arrived: 10:00 Time Left: 11:00 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 60 °F

Personnel on Site

Owners:	Andrew Reynolds, Theo VanAken, Fred Heiser
Contractors:	Ryan Inc., Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Mitch Stark
Other:	

Summary of Construction Activities

Heavy flooding from over 5" of rain over the weekend. Today will consist of pumping water from the site into the ponds, and discharging the ponds from the weir following sampling and after approval by the wastewater treatment plant lab. All coal has been delivered off site as of Friday afternoon.

Summary of CQA Activities

Site visit, observation. Placed two stakes at the sampling points that required further excavation (Points 4026 and 4040).

Notes:

Weekly progress meeting occurred. The plan for the week is to de-water the site, verify the remaining points for coal removal, and start to fill with sand. The west fence will be removed this week to allow for excavation of the coal underneath.

Inspector: Mitchell Stark Signature: 

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/17/2017

Time Arrived: 9:45 Time Left: 9:50 Page: 1 of 1

Weather: Clear Precipitation: none Temp: 60 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., 1 operator
Contractors:
CQA: E&E Solutions, Mitch Stark, Amy Mandrell
Other:

Summary of Construction Activities

Large amounts of water remain on site. Today will consist of pumping water from the site. The west fence will be removed today as well.

Summary of CQA Activities

Site visit, observation of construction activities.

Notes:

Inspector: Mitchell Stark Signature:

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/19/2017

Time Arrived: 12:00 Time Left: 15:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 62 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Area of ponded water from rainfall earlier in the week was being pumped (points 205, 206, and surrounding area). Operator excavated top layer via skidsteer for points 221, 204-210, 4128 to be surveyed. Additional fence along west side of property was removed. One operator was excavating the southwest corner of the property with a skidsteer. Sand was being delivered to site and spread around point 152 and surrounding area by Rob.

Summary of CQA Activities

Site visit and observation of construction activities. Verification/surveying of points 221, 204-210, 4128, and 186-192. Couldn't get data for points 205 and 206 - both were located in ponded water. No samples were taken.
Created/surveyed points 7512-7516 for stakes along property line as established by the licensed survey (Westshore Engineering) at Owners request.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/20/2017

Time Arrived: 1:31 Time Left: 4:41 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 76 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions,Amy Mandrell
Other:

Summary of Construction Activities

2 operators were excavating southwest corner with a skidsteer and excavator. Multiple loads of sand were delivered. 1 operator spread sand throughout verified area as stakes were put in. Water was being pumped out of various ponded areas.

Summary of CQA Activities

Site visit and observation of construction activities. Took retest samples at points 4068 (As and Cd) and 4078 (As). Used pink flags to mark eastern ash line at Rob's request (marked points 4006, 63, 4035, 4046, 4068, 4096, and 4148). Staked points 129, 147, 180, 232, 245, 4161, 4157, 240, 221, 186, 192, and 156 - area within these stakes is verified. Gave Rob a copy of CAD drawing with these points circled and area highlighted.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/26/2017

Time Arrived: 13:15 Time Left: 14:50 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 52 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions,Amy Mandrell
Other:

Summary of Construction Activities

Continued pumping water from the site after previous weekend rain. Fence has been completely removed along west perimeter of site. Had already excavated area along fence up to point 121. Were working on excavating further down fence around points 4107 and 4108. Plan to truck excavated material from site tomorrow. Tore up part of the electrical conduit that runs along the fence and filled in with sand (estimated by Rob to be 2 1/2 to 3 feet deep and 18" wide).

Summary of CQA Activities

Site visit, observation of construction activities. Took survey points 9000-9010 along both sides of the torn up electrical conduit at Rob's request. Surveyed sea wall and concrete structures along it (points 8000-8055, 8131-8161).

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/30/2017

Time Arrived: 1:45 Time Left: 3:30 Page: 1 of 1

Weather: Cloudy, Windy Precipitation: Rain Temp: 44 °F

Personnel on Site

Owners:
Contractors: Ryan Inc.
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

No construction activities today. Too wet to deliver sand or soil. Plan to continue pumping water from ponded areas rest of the week.

Summary of CQA Activities

Weekly meeting, site visit. Surveyed buried concrete (points 8057-8130) and east of lagoons/edge of road (points 9000-9010). Will need to create more verification points in the southwest corner, along western edge, and in the northeast corner.

Notes:

Weekly meeting: top soil was approved last week; discussed high levels of arsenic that have been observed in the results for CCR samples; dewatering permit expected Nov. 1st.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 10/31/2017

Time Arrived: 12:36 Time Left: 1:30 Page: 1 of 1

Weather: Cloudy Precipitation: Light rain Temp: 39 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Pumping and excavating top layer of about 2' along western concrete wall. Western pump house is sitting on top of coal - Rob would like to remove this pump house. Concrete throughout this area also appears to be sitting on a layer of coal. Plan for tomorrow is to have a small area to the west of verification point 196 ready for visual verification.

Summary of CQA Activities

Site visit. Area between fence and concrete wall seems to have coal present but not ash, based on visual observation and excavation of 1-2' along wall.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/1/2017

Time Arrived: 8:40 / 4:50 Time Left: 9:40 / 6:00 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 36/42 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Excavated a deep hole near point 120 and backfilled with sand right away as it was filling with water. Excavated another deep hole filled with coal around point 81 and backfilled with sand. Removed light pole and pump house. Sand was being delivered, and coal-soil removed. Operators were working on excavating an area along the Southwest property line using various equipment (excavator, skidsteer, loader).

Summary of CQA Activities

Observed the deep coal spots that were excavated and verified them prior to sand backfill. Visually verified and surveyed points 4113, 150, 133, 148, 164, 183, 201, 218, and 233.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/2/2017

Time Arrived: 1:37 Time Left: 4:30 Page: 1 of 1

Weather: Cloudy Precipitation: Light rain Temp: 52 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operator
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

All three operators worked on clearing the southwest corner of CCR material using various equipment (skidsteer, excavator, loader). No sand deliveries due to precipitation.

Summary of CQA Activities

Sampled and surveyed points 4109, 4114, 4117, 4118, 4120, 4123, 4124, 4167. Visually verified and surveyed points 134, 249, and 250. Pictures and elevation of points 134 and 250 were taken slightly to the west of each point due to concrete.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/2/2017

Area being excavated in southwest corner

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/3/2017

Time Arrived: 1:15 Time Left: 3:15 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 49 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Sand was delivered in several loads and spread over verified area to the east of points 192 and 156 using a Caterpiller D6 Dozer. Southwest corner was further clexcavated and skimmed with skidsteer. Continued to excavate north of points 4114 and 4118 using the same equipment. Coal-soil was transported to the large buried concrete pad using a loader to be trucked off site. Continued to pump water from yesterdays rain from various ponded areas.

Summary of CQA Activities

Surveyed and visually verified points 4166, 4125, 4121, and 4119 (no samples needed). Staked points 186, 4118, and 4114 - Rob said they would lay sand up until this line in the southwest corner.

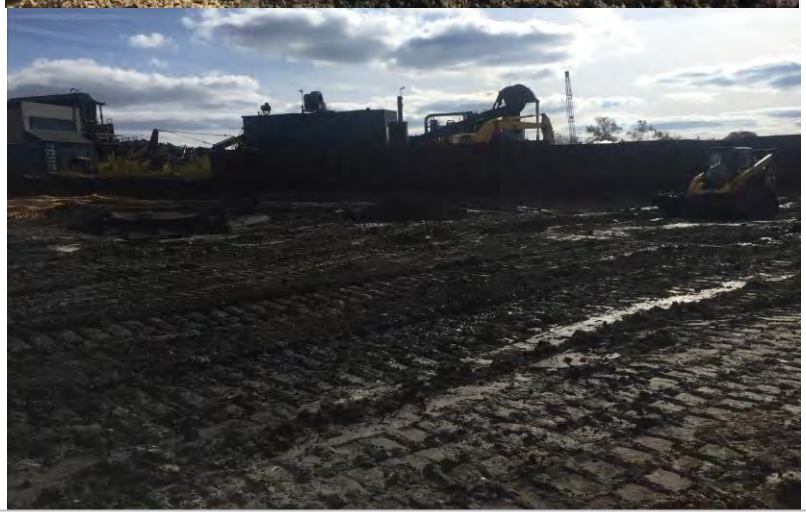
Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/3/2017



Southwest corner being excavated

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/6/2017

Time Arrived: 9:50 Time Left: 12:25 Page: 1 of 1

Weather: Clear, sunny Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Area prone to ponding on west side (between points 4110 and 4118) was cleared of CCR with excavator and skidsteer for verification. Coal-soil was being removed and trucked off site. Sand was removed and replaced after visual verification at points 168-170, as sand had been placed on these three points without prior verification. Skidsteer was used to remove the top mud-layer (due to rain) of previously verified points in approximate area of points 4068-4048 so that the area could be covered with sand by the dozer. The area to the north of these points was being excavated at time of visit with a skidsteer and excavator, and should be ready for sampling/verification tomorrow.

Summary of CQA Activities

Observed while area between points 4110 and 4118 was cleared of CCR with excavator - area is prone to ponding water. Points 4110, 4112, and 4115 from this area were visually verified. Sand had been placed on top of points 168, 169, and 170 without verification, so sand was removed and points were visually verified so that sand could be replaced. Staked points 129 and 130.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/6/2017

Area between points 4115 and 4110 being excavated

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/7/2017

Time Arrived: 9:50 Time Left: 1:15 Page: 1 of 1

Weather: Clear, sunny Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Sand was delivered in several loads and was being spread with the dozer in the southeast corner of the site. Coal-soil was being removed and trucked off site. One operator followed with excavator as points were verified to further remove area of coal and ash, as needed. Plan to cover points that were verified today with sand by end of day using the dozer.

Summary of CQA Activities

Visually verified points 62, 63, 76, 77, 89, 90, 4035, 4036, 102, 127, 4049, 4060, 4061, 4071, and 4084. Sample was taken at point 4084. Point 4049 had an excess of cinders present so it was staked for further excavation. Points 116, 128, and 141 were flagged but operators said they were located where the foundations of the conveyor belt used to be and there is ~20 foot of sand and flowable fill backfilled in this area.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/7/2017

Verified areas being backfilled with sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/8/2017

Time Arrived: 11:30 Time Left: 1:15 Page: 1 of 1

Weather: Clear, sunny Precipitation: None Temp: 46 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Sand was delivered in multiple loads and spread throughout the verified area surrounding Point 4035 using the Caterpiller D6 Dozer. The sea wall was filled with 4" rip rap and 40-50 yards of flowable fill (Brewer's City Dock, Inc. W-bag). Material from crushing one of the concrete structures/pads (located near the sea wall) was also used as fill. Ryan Inc. excavated the north portion of the coal-ash area (near the building) with an excavator and placed sand on the verified area from this morning's CQA visit.

Summary of CQA Activities

Site visit and observation of construction activities. Visually verified points 4002, 4003, 4007, 4008, 4009, 4016, and 4025. Samples were taken at points 4009 and 4025. Points 4037, 4026, 4017, and 4018 were flagged but not yet excavated so could not verify.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/8/2017

Sea wall filled with rip rap

Verified areas being backfilled with sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/9/2017

Time Arrived: 12:30 Time Left: 2:20 Page: 1 of 1

Weather: Cloudy,windy Precipitation: Very light rain Temp: 37 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Southeast corner along concrete walls has been cleared of CCR and was ready for verificaiton. At time of visit, points 4089 and 4090 were being cleared with an excavator. Soil was delivered in several loads and spread on top of sand in the southwest corner of the site using a dozer.

Summary of CQA Activities

Verified points 4093, 4096, 4100, 246, 247, 248, 4146, 4147, 4148, 4162, and 4163 visually. Took a sample at point 4096.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/9/2017

Verified area covered with sand layer

Point 199 / Portion of area excavated with skidsteer

Soil being layered on top of sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/13/2017

Time Arrived: 1:30 Time Left: 3:50 Page: 1 of 1

Weather: Cloudy, windy Precipitation: None Temp: 41 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

The CCR area was further excavated for verification of points 4017, 4018, and 4026 using an excavator. Sand was delivered in several loads and placed on top of verification points just to the west and south of these points (approximately points 4007, 4016, 4002, 4003, 4035, 4036, 4047-4049) using a dozer. Points 85-86 and 98-99 were being excavated for verification tomorrow using an excavator and skidsteer. Soil was being stockpiled to create a berm for over the winter to divide verified areas from the non-verified ash area. Don't plan to work Friday 11/17.

Summary of CQA Activities

Site visit, observation of construction activities. Verified certification points 4026, 4017, 4018, 137-139, 122-125, 110-112, 96-97, and 84. Samples were taken at points 4026 and 4018. Looked at manhole and storm pipe near outlet and discussed beehive/fantail options.

Notes:

Weekly meeting was held today. Coal area will be finished for verification tomorrow, excluding the road. Road will be cleared and ready for verification later this week. Plan to clean concrete pad/buried concrete before pausing for the winter. Discussed whether sand should be placed on top of concrete over winter or not. Also discussed other steps (i.e. what equipment will be stored on site) to be taken prior to halting for the winter. Fence should be in by 12/1.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/14/2017

Time Arrived: 12:30 Time Left: 3:30 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Soil delivered and spread over east portion of verified area via dozer. Coal-soil was pushed onto buried concrete for verification of points south of the pad. Had southern coal-portion of road excavated and ready for verification upon arrival. One operator, using an excavator, was excavating CCR material from around the manhole near the outfall to Lake Macatawa. Installed PVC pipe with fitting to old storm sewer pipe that had been leaking at the northwest corner of the storm water junction pipe. Old pipe was cut and fitted with a 6" CI/Plastic to 4" CI/Plastic fitting. A 4" PVC Type 1 ASTM D 2665 was then placed into the other end of the fitting. Currently have pipe temporarily tied to adjacent concrete storm structure to hold up - plan to get screws to hold pipe to building as a permanent solution. Also plan to finish pipe fitting and excavate the corner near the building (points 4006,4001) tomorrow.

Summary of CQA Activities

Site visit and observation of construction activities. Verified points 70, 85-86, 99-100, 113, 140, 135-136, 151-155, and 171-173. Took sample, picture, and elevation at point 4089 - staked this point for reference. Plan to overlay aerials onto verification grid to ensure points 116, 128, and 141 are over the concrete foundation (filled with approximately 20 ft of sand on top) from when the conveyor was removed. Observed and documented through pictures while leaking pipe was fitted with a tee.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/13/2017




Overview of the site



Teeing of leaking storm sewer pipe at the northwest corner of the storm junction box

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/15/2017

Time Arrived: 12:00 Time Left: 12:15 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 45 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc., Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

Worked a half day. No construction activities past noon due to rain other than pumping of water. Had Andrew from HBPW come during the morning to look at unlabeled concrete pad (located between verification points 4001 and 4002) not marked on plans, and leaking water pipe. Spread sand on verified areas until it was too wet to continue using a dozer. Began process of cleaning concrete pad free of coal.

Summary of CQA Activities

Site observation. No observable stormwater runoff exiting site.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/15/2017

No construction activities past noon due to rain. Pictures of site from buried concrete

Uncovered concrete pad located between points 4001 and 4002

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/16/2017

Time Arrived: 11:00 Time Left: 1:45 Page: 1 of 1

Weather: Cloudy Precipitation: Rain/Snow mix Temp: 37 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Had more of the road excavated of CCR material and ready for verification upon arrival. Continued to lay sand on east portion of verified area with the dozer. Sand was delivered in several loads. On-site equipment were being washed with high pressure water as part of routine maintenance. Operators continued to clean buried concrete slab by removing some of the coal layer covering it with the skidsteer. Area under concrete pad discovered yesterday (located between points 4001 and 4002) was pumped free of water. Once drained, the end of the leaking storm pipe was set with a Valterra 4"/110 mm gate valve. The hole was then filled with newly delivered sand by an expeditor. Plan to wrap up early today (3 pm) and will be taking tomorrow off.

Summary of CQA Activities

Site visit and observation of construction activities. Flagged and visually verified points 4001, 4006, 114, 126, 56, 69, 95, 108-109, and 121. Flagged but did not verify points 101, 115, 141, and 83. Areas were either too muddy or not excavated enough for verification. Observed and documented through pictures while area under concrete pad was pumped free of water, and while leaking end of water pipe was plugged. Surveyed concrete pad (pts 2000-2005), gate valve (pt 2006), and various depths of the hole (pts 2007-2018) in order to determine amount of sand used to backfill area. No observable stormwater runoff exiting site from this weeks storm events.

Notes:

From Rob Koski: ash hauling totals for year = 18,140 tons hauled to Ottawa Landfill (no more there hauling this year). Through Friday, Nov 10th Coal Yard fill = 8,984 tons received and placed. Coal material was trucked to Zeeland Township Landfill.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/16/2017



Overview of site



Gate Valve being placed on leaking storm pipe just east of the large concrete pad

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/20/2017

Time Arrived: 9:45 / 2:45 Time Left: 11:15 / 3:15 Page: 1 of 1

Weather: Sunny Precipitation: None Temp: 48 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Pumping of water from this past weekend's rain. Cleaning of buried concrete using skidsteer. Continued to spread sand over verified points (4025 and 4026, and 4037) surrounding concrete storm structure using dozer. Continued to stockpile sand along verified area's boundary for use in the spring. Plan to pump water and have remaining area ready for verification within next two days.

Summary of CQA Activities

Site visit and observation of construction acitivities. No areas ready for verification today.

Notes:

Rob would like an estimate of the amount of sand that covers the coal area, as well as an estimate of the amount of sand needed to store for coverage of remaining ash area in spring.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/20/2017





Sand being spread in verified area north of concrete storm structure



Ponding of water from past weekends rain and cleaning of buried concrete

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/27/2017

Time Arrived: 11:15 / 3:15 Time Left: 11:55 / 3:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 37 °F

Personnel on Site

Owners:	
Contractors:	Ryan Inc., Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	NTH (2), West Michigan Drilling (2)

Summary of Construction Activities

Half of the coal-soil has been removed from the pile sitting on the large concrete pad via one truck - one more truck should stop by this afternoon to remove the rest. Plan to power wash (this afternoon) a strip ~5 feet wide along north portion of buried concrete pad, and lay sand so that there isn't a steep dropoff between the parking lot and the pad. They have began working on the fantail that will be placed at the stormwater manhole (between points 134 and 135) near the outfall. NTH/West Michigan Drilling were present to begin installation of wells. At time of visit they were installing MW-3. Rob had them place it 5 feet east of where fence will be re-installed. The last ~20 feet to the west of the concrete wall/Existing Pond 3 has not been covered with sand or soil although verified. Rob said the wall appears to be sitting on coal and will not be removed until spring, and area has ponded up such that they can't reach it until water is drained. May or may not cover it this fall. / Afternoon Visit: Ryan Inc.had wrapped up for the day, while NTH/West Michigan Drilling were working on drilling the final well (MW-1); wells MW-3 and MW-2 had been installed earlier in the day.

Summary of CQA Activities

Site visit. Observation of construction activities and of installation of wells.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/27/2017

Cleaning of buried concrete pad. Sand added along parking lot/concrete pad dropoff

Sand piled along verified edge, to the south of concrete storm structure

Drill MW-3 being installed (left) Preparation for the fantail at the stormwater manhole (right)

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/28/2017

Time Arrived: 11:15 Time Left: 11:55 Page: 1 of 1

Weather: Cloudy, windy Precipitation: None Temp: 55 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other: NTH (2), West Michigan Drilling (2)

Coal-soil has been completely trucked off site from large concrete pad. Have begun the fantail at the stormwater manhole located near the outfall (between points 134 and 135). Plan to place 2" or 4" riprap this afternoon and smooth out sides. Large concrete pad has been cleaned of visible coal and was being power washed. Due to high winds may not finish power washing until tomorrow. Were washing the equipment free of coal in preparation for grading. Plan to work on grading and be finished by end of the week. Fence should be going in next week. All three wells have been installed by West Michigan Drilling under the observation of NTH.

Summary of CQA Activities

Site visit. Observation of construction activities and of wells. E&E was present while drilling soil was checked at Well-3.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/28/2017

Mid-cleaning of large buried concrete pad

Fantail mid-installation at stormwater manhole (located between points 134 and 135)

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/29/2017

Time Arrived: 10:10 Time Left: 11:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 37 °F

Personnel on Site

Owners:	HBPW, Andrew Reynolds
Contractors:	Ryan Inc., Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Rob and two operators were working on power washing the large concrete pad. Plan to place 4" rip rap on fantail at stormwater manhole, but had not done it yet at time of site visit. Have used both Caterpiller D6 Dozer and Caterpiller Expidator 326 to compact and place all sand on verified areas. Fence was originally to be installed December 6th-8th, however dates have been pushed back to December 11th-13th.

Summary of CQA Activities

Site visit and observation of construction activities. Took four 40-pound samples of sand from various locations evenly distributed throughout the stockpiled sand for the Modified Proctor Test (ASTM D1557) and size distribution. Dropped off two bags of sand to Drisienga & Associates for testing (2 pm) and kept two at the office. Rob gave us the quantity of sand present on site as 13,424 tons (9,258 CY). Only one sample per 5,000 CY was needed for the Modified Proctor Test. Spread out one bag (Sample 3) to dry overnight to be used in determing the grain size distribution.

Notes:

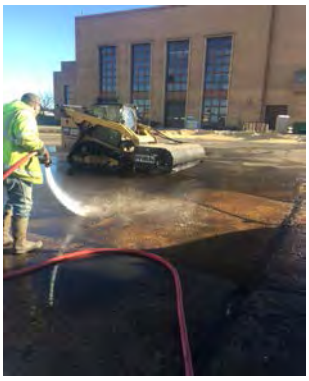
Rob and Andrew discussed how ponds will be left over the winter. Ponds 1 and 2 are both at static groundwater levels. Discussed leaving a pump on site over the winter in case a large stormwater event occurs. Andrew also observed site progress and the new wells.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 11/29/2017





Power washing of large buried concrete pad

Well MW-3

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 12/7/2017

Time Arrived: 11:50 Time Left: 4:15 Page: 1 of 1

Weather: Cloudy Precipitation: Snow Temp: 27 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell, Mitch Stark
Other:

Summary of CQA Activities

Confirmed elevations of excavated points (prior to sand/soil) 41, 67, 93, 120, 249, 250, 4003, 4061, 4071, 4147, 4163, 4166, and 4167 with GPS. Took final elevations with GPS for 41-42, 54-56, 67-70, 81-89, 93-102, 107-115, and 120-127. Determined soil depth at these points, excluding 87-89, 100-102, 113-115, 125-127 (elev. only). Mitch ran field density tests at 18 different points as three tests per acre were required. Surveyed points as D1-D18 in job HBPW Soil.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 12/8/2017

Time Arrived: 2:35 Time Left: 5:32 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 31 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of CQA Activities

Determined soil depth at points 87-89, 100-102, 113-115, 125-127 (elevations taken yesterday). Took elevation and recorded soil depth for points 116, 128-130, 133-145, 148, 4109, 4110, and 150-160. Points 90 and 146 are covered by the soil stockpile edge. Point 49 is on the edge of the sand stockpile. Surveyed elevation of sand at points 61-63 and 74-77.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 12/11/2017

Time Arrived: 10:45 Time Left: 4:20 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 31 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors: Michigan Fence Co. Inc., 2 workers
CQA: E&E Solutions, Amy Mandrell, Mitch Stark
Other:

Michigan Fence Co. Inc. was there for roughly an hour to discuss where the fence would be going in with Rob and 1 operator.

Summary of CQA Activities

Used GPS to take elevation at points (by line) 164-176, 183-192, 201-210, 218-4129, 233-4132, 249-4144, and 250-4162. Used shovel and tape measure to determine soil depth at these locations as well. Tim said (and Rob confirmed) that the back southeast corner is not to grade - did not take elevation or determine soil depth for verified points in this area.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 12/11/2017

Finished fantail with silt fence

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 12/14/2017

Time Arrived: 9:30 Time Left: 12:35 Page: 1 of 1

Weather: Cloudy Precipitation: Snow Temp: 14 °F

Personnel on Site

Owners:
Contractors: Ryan Inc., Rob Koski, 1 operator
Contractors: Michigan Fence Co. Inc., 4 workers
CQA: E&E Solutions, Amy Mandrell
Other:

Working on fence along south and west end. All posts are in, were beginning to add mesh.

Summary of CQA Activities

Site visit and observation of construction activities. Confirmed elevations for points 41-250 (coal yard), and 4001-4007 (CCR area).

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 12/18/2017

Time Arrived: 8:40 Time Left: 11:40 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 37 °F

Personnel on Site

Owners:
Contractors:
Contractors: Michigan Fence Co. Inc., 4 workers
CQA: E&E Solutions, Amy Mandrell
Other:

Michigan Fence Co. was working on finishing up fence - all posts are in and all mesh is up.

Summary of CQA Activities

Site visit and observation of construction activities. Confirmed elevations for points 4008-4167.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 12/20/2017

Time Arrived: 2:15 Time Left: 3:00 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 34 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Fence was finished on Monday 12/18/17 after site visit. Took some pictures of fence to document.

Summary of CQA Activities

Surveyed location of Well-1 through Well-3 using the Leica GPS. Took three measurements per well (Top of well protective casing, bottom of well/concrete pad, topsoil).

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 1/8/2018

Time Arrived: 1:45 Time Left: 4:15 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 34 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell, Mitch Stark
Other:

Summary of CQA Activities

Surveyed existing well MW-7. Surveyed new wells W-1 to W-3.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 1/8/2018

Pictures of the site from point TP1

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 2/26/2018

Time Arrived: 1:00 Time Left: 1:15 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 44 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of CQA Activities

Quick check on site to see how winter snow melt is draining. Site appeared to be draining well with exception of ponding on top of the large buried concrete pad.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 2/27/2018

Time Arrived: 3:00 Time Left: 3:35 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 50 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of CQA Activities

Quick check on site to see how winter snow melt is draining. Site appeared to be draining well with exception of ponding on top of the large buried concrete pad.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 2/27/2018

Overview of site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 3/19/2018

Time Arrived: 12:30 Time Left: 1:15 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 47 °F

Personnel on Site

Owners:	Judy Visscher, Andrew Reynolds
Contractors:	
Contractors:	
CQA:	E&E Solutions, Amy Mandrell, Kurt Van Appledorn
Other:	

Summary of CQA Activities

Placed stakes at 7 boring locations - 84, 125, 206, 228, 176, 196, and 216.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 3/19/2018

Overview of site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 3/20/2018

Time Arrived: 7:55 Time Left: 2:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 24 °F

Personnel on Site

Owners: Andrew Reynolds
Contractors:
Contractors: Job Site Services - Bob Miller
CQA: E&E Solutions, Kurt Van Appledorn, Amy Mandrell
Other:

Summary of CQA Activities

Borings were done by Bob Miller of Job Site Services. Borings took place at points 84, 154 (moved from 125 due to the stormwater main), 206, 213 (moved from point 228 to be closer to point 196), 216, 196, and 176. A picture was taken of each boring, and Kurt filled out boring logs for each point. Three samples from various depths of natural material were dropped off to ALS to be tested for Arsenic levels. Point 196 had an unnatural layer of dark/black ash material with some cinders present; as a result, another boring was done 20 feet north of the point and the same material was found, but to a lesser degree - no samples were taken at this point, and a bore log was written (GP-196+20N).

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 3/20/2018







Pictures from several of the borings (not in any particular order)

Picture of unnatural material found at point 196

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/2/2018

Time Arrived: 12:10 Time Left: 12:45 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 40 °F

Personnel on Site

Owners: BPW - Andrew Reynolds
Contractors: Ryan Inc. - Rob Koski, Tim
Contractors: Dewind Dewatering
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan Inc. was on-site getting the project back up and running. Surface water was being pumped, and they were discussing dewatering options. Dewatering system/wells were being installed - were working near the south end of the site during visit by CQA.

Summary of CQA Activities

Site visit. Provided Rob with a copy of the updated Grid Nodes Plan, and pointed out point additions to CCR area (4168 through 4181). Grabbed sand Samples 5 and 6 - Sample 5 for a Modified Proctor test by Drisienga, and Sample 6 for a sieve/distribution test by E&E.

Notes:

Andrew was present to flag the location of the 96" storm sewer that runs across the site for reference.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/2/2018

(left) Pumping of surface water (center) Andrew flagging the 96" storm sewer (right) CQA

Part of the dewatering set-up

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/3/2018

Time Arrived: 10:15 Time Left: 10:30 Page: 1 of 1

Weather: Cloudy Precipitation: Light rain Temp: 35 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, Tim
Contractors: Dewind
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan Inc. was on-site getting the project back up and running. Ryan is continuing the pumping of surface water today, and the dewatering system/wells were continuing to be installed on site - at time of visit they were working alongside Pond 2. Rob said Judy (BPW) will be on site Thursday to take a sample. Earliest day for sampling of soils, depending on when the water sample results are back, will most likely be next Wednesday. Several 10,000 gallon tanks had been delivered by Proact and were sitting alongside the building.

Summary of CQA Activities

Site visit. Discussed plan for rest of the week with Rob.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 43/2018

Pumping and ongoing installation of wells in lagoons

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/4/2018

Time Arrived: 11:00 Time Left: 11:45 Page: 1 of 1

Weather: Cloudy, 25 mph winds Precipitation: Snow Temp: 27 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, Tim
Contractors: Dewind, Proact
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan is continuing the pumping of surface water, and Dewind continued to set up the dewatering system. Wells are being installed via drill - there was too much "gunk" in the ground for jet installation. Well was being installed at northeast corner of Pond 2 during visit. Judy will take a sample at 3 pm today - results should be back Tuesday morning. If results are good excavation of ash material will begin. Not much work for Ryan besides pumping until then - plan to work a half day tomorrow, and take Friday and (potentially) Monday off. Treatment system is mostly in place - just 2 more hours of work, including placement of filters, according to Rob. The 10,000 gallon tanks had been moved from near the building and onto the large concrete pad, and connected to bag filters. The dewatering system works by transferring the water from the pumps to 2 of 4 10,000 gallon tanks (only 2 are used at a time; the other 2 will be used in a rotation as filters need replacing). After exiting the tanks, the water goes through bag filters, is sampled, and then is released to the lake via the outfall 002 storm manhole.

Summary of CQA Activities

Site visit. Discussed dewatering system and plan for rest of the week with Rob and Tim. Rob would like the east boundary of the ash limits to be staked for an idea of how far to excavate. CQA sampling will be needed Tuesday at the earliest, after Ryan starts dewatering and ash removal activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/4/2018

Parts of the dewatering set-up

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/10/2018

Time Arrived: 1:50 Time Left: 2:20 Page: 1 of 1

Weather: Clear skies, sunny Precipitation: None Temp: 41 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, Tim
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Received results of the dewatering samples taken from ALS yesterday afternoon (4/9/2018), and the dewatering system was started this morning. Pond 1's water level was down 4" at the time of the CQA's visit. Ryan's plan is to continue pumping/dewatering today and tomorrow. They plan to start excavating at the south end of the CCR area (Point 4164) and work their way north, starting tomorrow afternoon or Thursday morning.

Summary of CQA Activities

Site visit. Observed dewatering system and discussed plan for rest of the week with Rob and Tim. Said they likely won't need verification of excavation until Thursday afternoon.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/10/2018



Dewatering System



Pond 1


Ponds 2 & 3

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/11/2018

Time Arrived: 1:30 Time Left: 1:55 Page: 1 of 1

Weather: Clear skies, windy Precipitation: None Temp: 47 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, Tim
Contractors: Pitsch Co.
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to pump surface water and dewater the ponds. Ryan's plan is to continue pumping/dewatering today and start excavation tomorrow. Pitsch Co. had demolished the remaining concrete wall near Pond 3 and was working on the demolition of the weir at the south end of Pond 3.

Summary of CQA Activities

Site visit and observation of Pitsch Co. begin the demolition of the weir near Pond 3.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/10/2018

Pitsch Co. demo of the remaining concrete wall and weir near Pond 3

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/16/2018

Time Arrived: 10:15 / 2:55 Time Left: 12 / 3:30 Page: 1 of 1

Weather: Cloudy Precipitation: Rain/snow Temp: 34 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell, Blaine Litteral
Other:

Summary of Construction Activities

Ryan started excavation of CCR material in the south corner of the remaining CCR area. For the first visit they had Point 4164 cleared and ready for verification. The Pond 3 weir and Point 4165 were mostly excavated but not ready for verification. At time of the second visit by CQA, Ryan used a dozer and excavator to remove CCR material north of the weir in Pond 3. Ryan plans to continue excavation of CCR material tonight and tomorrow morning and hope to have more points ready for verification around noon.

Summary of CQA Activities

Site visit and observation of construction activities. Documented verification of Point 4164 and took a sample, that was delivered to ALS.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/16/2018






Excavation of Pond 3 CCR Material

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/18/2018

Time Arrived: 9:45 / 2:00 Time Left: 11:50 / 3:45 Page: 1 of 1

Weather: Clear / Cloudy Precipitation: None / None Temp: 34 / 44 °F

Personnel on Site

Owners: HBPW - Andrew Reynolds, Jane Monroe (PM visit only)
Contractors: Ryan Inc. - Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

(AM) Ryan began excavation of Pond 3 yesterday and ran into approximately 7-8 feet of peat material. They were not certain if they would have to dig below this or not, and decided to work further north of Pond 3 today. They excavated Points 4037 and 4038 for documentation, and they continued to excavate the area surrounding these points.
(PM) Rob and Tim were present and had Points 4165 and 4149 ready for visual verification. Were also wanting an answer as to whether the weir is verified for backfill.

Summary of CQA Activities

Site visit and observation of construction activities. (AM) Documented verification of Points 4037 and 4038, and delivered samples to ALS for anlaysis. Excavated soils were a grey clay with layers of black peat and a brown silty sand layer on top. Flagged Point 4079 at the request of Rob, and staked the updated CCR area's east edge.
(PM) Visually documented Points 4165 and 4149 - need to look at Point 4149 with the microscope due to grey sand/clay. Looked at the weir and took photos/bag sample for further inspection prior to verification for backfill. After doing the microscope analysis, Point 4149 appears to be sand and the weir appears to have greater than 5% ash - Blaine let Rob know to further excavate the weir.

Notes:

(AM) Andrew was present during the excavation and verification of Points 4037 and 4038.
(PM) Andrew and Jane were on site for a walk around. Jane and Rob would like all Preliminary anayltical reports sent to them.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/18/2018

Ongoing excavation of CCR Area just north of Point 4038

Pictures of excavated weir

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/19/2018

Time Arrived: 8:50 Time Left: 10:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 40 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Prior to the visit, Ryan further excavated the weir for verification. At time of visit, Ryan was working on the excavation of CCR material in the north portion of the CCR area, using a dozer and excavator. They plan to excavate further north from the weir so that Points 4104-4151 are ready for verification this afternoon.

Summary of CQA Activities

Site visit and observation of construction activities. Took photos of the weir and another bag sample for verification via microscope. Flagged Points 4104 and 4151 at request of Rob. Microscope verification of weir still looked ashy so asked Rob to excavate more from the bottom of the weir.

Notes:

Contacted Bill Carey of ALS to update results for Point 4164 dropped off on 4-16-2018; mislabeled point as 4146 on original Chain of Custody.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/19/2018

Ongoing excavation of CCR Area in the north portion of the CCR area

Ongoing excavation of the weir

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/20/2018

Time Arrived: 8:00 / 1:50 Time Left: 11:30 / 2:45 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 50 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell, Blaine Litteral
Other:	

Summary of Construction Activities

Ryan excavated an additional 2' of material from the weir this morning prior to a sample being taken and verified via microscope. Ryan went back to Point 196 and removed the topsoil and sand with the dozer. They then used the excavator to chase the ash still present in the area, as found during the March 20, 2018 borings. Ryan plans to work on the excavation of Pond 1 tomorrow and said they likely won't need observation until Monday.

Summary of CQA Activities

Site visit and observation of construction activities.
(AM) Took another sample from the weir and looked at it under the microscope. The sample was free of ash so Rob was told he could backfill the weir. Observed as they re-excavated the area surrounding Point 196 to chase the ash still present in this area. Once Point 196 itself was excavated down to the grey sand it was documetned, and a sample was taken and dropped off to ALS for testing.
(PM) Surveyed the limits of the CCR excavated near Point 196. Double checked to ensure no other surrounding points are in this area. Documented and sampled Point 4151.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

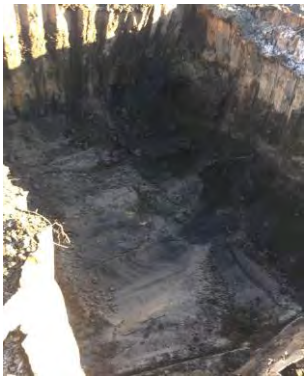
Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/20/2018



Excavation of area surrounding/north of Point 196






Pictures of excavated and backfilled weir

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/23/2018

Time Arrived: 7:55 / 2:30 Time Left: 11:35 / 3:40 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 70 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell, Blaine Litteral
Other:	

Summary of Construction Activities

Ryan continued to excavate CCR material over the weekend via dozer and excavator, and had the inside bottom of Pond 1 excavated of CCR material, ready for verification by the morning of 4/23/2018.
(AM) At time of visit Ryan was excavating CCR area from the vicinity of sample Points 4063 and 4079. They had a ditch excavated of CCR material that fell directly to the east of Point 4079 and west of 4063,and were working to excavate this spot before it filled back up with water. Ensured CCR material was removed and took a photo for reference. Ryan had a portion of Pond 3 down to natural, brown sand, however weren't ready for verification at time of visit. Excavated CCR material is currently being gathered on the northeast portion of the remaining CCR area. Trucks will begin to move this material off-site tomorrow, 4/23/2018.
(PM) At time of visit Rob was using the excavator to excavate the CCR material out of Pond 2. The west bottom-half appeared to be excavated to sand while the other half was not. Hope to be ready for verification within the next few days. They also had the western slope of Pond 1 further excavated, but not ready for verification.

Summary of CQA Activities

Site visit and observation of construction activities.
(AM) Visually verified/documented Points 4042, 4043, 4056, 4055, 4054, 4066, 4079, and 4063. Four of these points (4055, 4066, 4063, and 4079) were also samples. Samples were gathered and dropped off to ALS by noon. Flagged Points 4030, 4102, 4104, and 4150 as references for additional Sample Points, as requested by Rob. Blaine requested an SPLP from ALS for Points 4037 and 4038.
(PM) Flagged each point along the eastern edge of the CCR area at the request of Rob, in addition to Points 4077, 4076, and 4075. Visually verified and took a sample at Point 4030 - took it approximately 10' south due to 60" concrete storm sewer.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/23/2018



Pictures of excavated bottom of Pond 1 (Have yet to clean walls)


Ongoing excavation of ditch to east of Point 4079/West of 4063

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/24/2018

Time Arrived: 1:00 Time Left: 1:45 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 63 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan's plan for today is to load and truck out the excavated CCR material currently stockpiled on the north portion of the CCR area. In addition to that, they plan to place backfill sand over the excavated area near Point 196 - results received on 4/23/18 showed the sample taken met all criteria.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/23/2018

CCR material stockpile being loaded into the trucks to be taken off site

Backfilling of sand near Point 196

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/25/2018

Time Arrived: 9:00 / 3:00 Time Left: 11:00 / 3:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 56 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan had 4 trucks running yesterday which took 16 loads of CCR material off-site. Today they have 6 trucks running and hope to get 20-25 loads of CCR material trucked off-site. Plan for today is to continue trucking material off-site and to backfill the excavated hole just to the east of Point 4079, as the sample received this morning tested by ALS met all criteria. Had Pond 2 excavated and ready for visual verification and sampling.

Summary of CQA Activities

Site visit and observation of construction activities. (AM) Re-sampled Point 4055 after several more inches were excavated, to be tested solely for selenium. Documented Points 4082, 4083, 4087, and 4088 and sampled Points 4087 and 4083. All three samples were delivered to ALS by noon. Looked at Points 4082 and 4087 under the microscope due to gray color - both appeared to have slightly more than 5% ash. Also looked at a sample of some of the silty, wet, clumpy material that was still present in the bottom of the pond - after looking at it under the microscope it appears to be mostly ash. Rob said they would excavate another foot or two down in the pond tomorrow. (PM) Flagged Points 4038, 4050, and 4051 at the request of Rob.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/25/2018

Filling in of ditch excavated to the east of Pt 4079/west of 4063

Pond 1 Overview

Pond 2

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/26/2018

Time Arrived: 9:00 / 3:00 Time Left: 12:15 / 3:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 54 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to have trucks take CCR material off-site. They excavated the bottom of Pond 2 down an additional foot, but plan to take it roughly another foot down this afternoon. They had Points 4050 and 4051 ready for visual verification. They further excavated Point 4038 because it was on the edge of the area where they were collecting CCR material. They had placed sand late yesterday afternoon or early this morning over the area that includes points 4062-4063, 4072-4073, 4079, and 4085 - but some of these points hadn't yet been visually verified. Rob said he had told one of the operators to lay sand not realizing they weren't all visually verified. One operator went back with the excavator and excavated the sand off the area of these points so I could document them. Point 4085 had some ash present so Rob will have it further excavated later today.

Summary of CQA Activities

Site visit and observation of construction activities.
(AM) Visually verified points 4050 and 4051. Re-took photos for Points 4037 and 4038 as they had excavated some more off the two points even though they were already verified. Visually verified Points 4062, 4072, 4073, and 4085. Looked at material from 4085 under the microscope due to gray color and let Rob know the point needed some additional material removal because more than 5% ash was present in the sample. Looked at another sample of material from Pond 2, which we couldn't tell whether it was natural or contained ash or not, under the microscope with Kurt and he said the material appeared to be a natural silt or clay. Flagged points 4080 and 4086 for reference at request of Rob. Also e-mailed Rob a copy of the data file containing the points - he said he might try to load them onto Ryan's GPS to aid in locating points when CQA is not present.
(PM) Flagged points 4027, 4028, 4039, 4040, and 4052 at request of Rob.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/26/2018

Culvert along Points 4035, 4050, 4051, 4063, and 4073

South view of site from Point 4085 / North view of site from Point 4085

Pond 2 after an additional foot was excavated off the bottom

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/27/2018

Time Arrived: 9:00 / 1:30 Time Left: 11:40 / 3:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 49 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, 3 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan continued to have CCR material trucked off-site.
(AM) Ryan had Points 4150, 4105, and 4102 in Pond 3 ready for verification. They were working on excavating CCR material out of Pond 3 at time of visit, and plan to continue working on excavating out the bottom throughout this afternoon with the excavator and dozer. They further excavated Point 4085 during visit by CQA so that it could be re-visited. They do not plan to be working over the weekend.
(PM) Worked to excavate a tiny culvert along the bottom-west edge of Pond 3.

Summary of CQA Activities

Site visit and observation of construction activities.
(AM) Took samples at Points 4150 and 4102 and delivered them to ALS. Visually verified points 4105, 4039, 4028, 4027, and 4019. Re-documented Point 4085 after the area was further excavated.
(PM) Took a sample from Pond 3 for look at under microscope. Flagged points 4004 and 4010 at request of Rob. Looked at three additional material samples from Pond 2 under the microscope due dark gray-black color.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/27/2018



Northwest portion of CCR Area



Pond 2



Pond 3

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/30/2018

Time Arrived: 9:00 Time Left: 11:35 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 50 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, 3 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan had the culvert found in Pond 3 further excavated Friday afternoon after site visit. For today's visit, Ryan had the eastern slope of Pond 3 and Point 4010 ready for visual verification. Also had Points 4104 and 4101 on the western edge of Pond 3 ready for sampling/visual verification. Plan to have the rest of Pond 3 points excavated and ready for verification by Wednesday afternoon, since the dewatering system will be turned off. Once the dewatering system is off they plan to work north through the remaining points. Rob plans to have one operator via a dozer spread sand over the verified Points 4027-4029, 4037-4039, 4050-4051, 4062-4063, and the rest of this area.

Summary of CQA Activities

Site visit and observation of construction activities. Visually documented points 4106, 4103, 4099, 4010, 4104, and 4101. Took a sample at Point 4104 and dropped off to ALS for testing. Looked at sample 4101 under the microscope due to gray color - grains appear to be natural. Took photos of Pond 3 culvert.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 4/30/2018




Pictures taken along Pond 3 culvert



General site pictures

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/1/2018

Time Arrived: 9:00 / 2:30 Time Left: 9:30 / 6:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Sand was being delivered directly into the south (verified) half of Pond 3 and Ryan operators were using a dozer and excavator to spread the sand. Had the rest of Pond 3 points excavated and ready for verification and several of the points located on the berm between Ponds 1 and 2 ready for verification for CQA. Excavated another foot off the bottom of Pond 1 via excavator and dozer due to high SPLP selenium results.

Summary of CQA Activities

Site visit and observation of construction activities. Visually verified points 4095, 4098, 4092, 4076, 4094, 4097, and 4075. Took samples at points 4094 and 4075. Re-documented and re-sampled pond 1 points 4055 (4055-retest 2) and 4030 (4030-retest) due to high SPLP for selenium results.

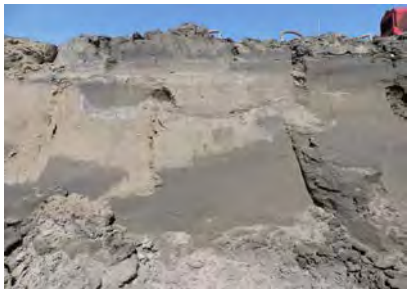
Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/1/2018




Pond 1 pictures after Ryan excavated an additional foot



Pond 2 prior to being backfilled with sand


Pond 3 being backfilled with sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/2/2018

Time Arrived: 1:10 Time Left: 4:00 Page: 1 of 1

Weather: Windy Precipitation: None Temp: 80 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Sand continued to be delivered to the site today. Pond 3 had no additional sand added to it today. Pond 2 had sand placed directly in it via the dozer, and then another operator would spread it out. During time of visit they began placing sand in pond 1 via dozer as well. The dewatering system has been turned off Ryan plans to pull the well points out over the next week to excavate the upper walls of all three ponds. Plan to have verification and density testing tomorrow (5/3).

Summary of CQA Activities

Site visit and observation of construction activities. Dropped off yesterday's samples to ALS first thing this morning. Visually verified points 4091, 4090, 4086, 4080, and 4181. Also surveyed the bottom of Pond 1, and surveyed the walls of Ponds 2 and 3 where the sand stops since Ryan had already began filling them. Looked at Pond 1 points 4042, 4043, 4054 and 4056 under the microscope - all four appear free of CCR material. Also looked at Points 4080 and 4091 under the microscope due to light brown coloring - both appear to be free of CCR material.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/2/2018

Pond 1 (left) and Pond 2 (right) backfilled with sand

Backfilled area along the northwest portion of the verified CCR area

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/3/2018

Time Arrived: 8:00 Time Left: 11:15 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 62 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Sand continued to be delivered to the site today. Two operators were using a dozer and skidsteer to spread the sand along the west edge of the recently verified CCR area (Points 4091, 4090, 4086, 4080, 4081). Rob plans to continue having sand delivered and spread over the verified areas over the next two days.

Summary of CQA Activities

Site visit and observation of construction activities. Used the Troxler density gauge to take four recordings in Pond 3 and one in Pond 2- all were greater than 90% compaction. Surveyed the top edges of Ponds 1, 2, and 3. Observed a layer of coal around the already verified areas around Ponds 2 and 3 so asked Rob to excavate a layer off before laying sand.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/4/2018

Time Arrived: 1:30 Time Left: 4:30 Page: 1 of 1

Weather: Clear Precipitation: Light drizzle in the morning Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnathan, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Sand and topsoil continued to be delivered to the site today. Two operators were using a dozer and skidsteer to spread sand along the west edge of the verified CCR area (Points 4093, 4089, 4078) as well as in all three ponds. Topsoil has been placed on top of the sand along the west side of the verified CCR area surrounding Point 196 and up to the west edge of Pond 3. Plan for the weekend is to continue spreading sand over the verified CCR areas and to continue excavating CCR material towards the north.

Summary of CQA Activities

Site visit and observation of construction activities. Used the Troxler density gauge to take one additional density/moisture recording in Pond 2 and two recordings in Pond 1 - all were greater than 90% compaction. Re-tested the density of Test No. 14 and Test No. 15 from the 12-7-2017 Troxler Density tests which failed with less than 90% compaction - found both spots to be greater than 90% compaction during re-testing. Took three additional density measurements along the west verified area, which already had soil graded on top of the sand. Rob had placed a second lift of sand in Pond 3 so four additional density recordings were taken in Pond 3 - all of which passed with readings greater than 90% compaction. Currently have 30 density recordings for the first lift across the 8 acre site and four recordings for the second lift in Pond 3.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/4/2018

Density testing in all three ponds

Verified area covered in topsoil in the area of Point 196

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/7/2018

Time Arrived: 8:12 / 2:45 Time Left: 10:40 / 4:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 65 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

Sand and topsoil continued to be delivered to the site today. Two operators were using a dozer and skidsteer to spread sand along the center of the verified area inlcuding the points verified today (points 4040, 4041, 4052, 4064, 4065, 4074, and 4081, with the exception of Point 4053- still waiting on results from ALS). Rob plans to continue having sand delivered and spread over the verified areas over the next two days. Before to today's visit, Ryan had covered three of the points verified today with sand prior to verification (4065, 4074, and 4081). One operator went back with the excavator and excavated the sand off of the general area. Ash was found between points 4081 and 4082 so the operator excavated the area to natural soils before placing clean sand on the points.
(PM) Placed lift number 2 in Ponds 1 and 2 and were working on placing lift number three in Pond 3 at time of visit. Plan to spend the rest of the afternoon and tomorrow morning chasing the ash still present in the east wall of Pond 1 and at Point 4077.

Summary of CQA Activities

Site visit and observation of construction activities.
(AM) Documented the verification of points 4040, 4041, 4052, 4053, 4064, 4065, 4074, and 4081. Point 4053 was a sample point so a jar sample was dropped off to ALS by noon for metals testing.
(PM) Used the Troxler density gauage on the second lift placed in Ponds 1 and 2 today - all four tests passed. Took three additional density measurements on the first lift in the area verified earlier today - all passed with greater than a 90% proctor value. Looked at a sample from the southeast corner wall of Pond 1 under the microscope at Rob's request - appears to be a silty clay with greater than 5% CCR material present, so Rob knows to take it out.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/7/2018

General pictures from today's verified area

Excavating the CCR material found between Points 4081 and 4082

Topsoil along west edge of verified CCR area

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/8/2018

Time Arrived: 8:15 Time Left: 11:45 Page: 1 of 1

Weather: Clear, windy Precipitation: None Temp: 68 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Sand and topsoil continued to be delivered to the site today. One operator using a dozer placed the third lift of sand in Pond 3 as sand was delivered directly into the pond. Another operator continued to excavate the north portion of the ash area (approximately points 4012 and 4021) using the excavator for verification later in the afternoon or tomorrow. After CQA left yesterday they had placed topsoil on the verified and sanded area to the west of Pond 3. Ryan plans to place another lift in each of the ponds for density testing this afternoon.

Summary of CQA Activities

Site visit and observation of construction activities. Documented the verification of points 4029, 4020, 4011, 4005, and 4004. Points 4020 and 4005 were sample points so a sample for each was dropped off to ALS by noon for metals testing. Used the Troxler density gauage to take density recordings on the third lift placed in Pond 3 - all four recordings passed. Dropped off three sand samples to Drisienga for modified proctor tests (Samples #7-9).

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/8/2018

General pictures from today's site visit

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/9/2018

Time Arrived: 8:50 Time Left: 11:50 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 63 °F

Personnel on Site

Owners: HBPW - Andrew Reynolds
Contractors: Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Sand continued to be delivered to the site today and placed directly into Pond 2. CCR material continued to be trucked out. One operator using a dozer placed a fourth lift of sand in the south half of Pond 3 while another using a dozer spread the third lift of sand in Pond 1. Ryan had the east wall of Pond 1 excavated and were uncertain whether some material was ash or not - asked CQA to look at samples under the microscope. They also dug two test pits on the far east edge of the CCR area to determine how deep the ash is in this area.

Summary of CQA Activities

Site visit and observation of construction activities. Documented the verification of points 4012, 4021, 4022, 4031, 4032, 4178, 4179, and 4180 for backfill. Points 4032 and 4180 were sample points so a sample for each was dropped off to ALS by noon for metals testing. Used the Troxler density gauge to take density recordings on the south portion of the fourth lift placed in Pond 3 - both recordings passed. Took two additional density testings in Pond 1 on the third lift of sand - both passed as well. Looked at the various samples (Samples 1 through 10) under the microscope that Rob requested. Determined Sample 1 to have greater than 5% ash present; 2 had less than 5% ash and was ok to leave; 3 was mostly ash; 4 was purely sand; 5 is the natural historic lake bottom; and 6, 7, 8 9, and 10 had greater than 5% ash present. Blaine let Rob and John know to excavate down to the layer where sample 5 was taken. Received results from ALS for points 4020 and 4005. At sample location 4005, results were all below applicable criteria except for selenium, which was much higher than the background value (5,700 vs 1,000). As the elevated selenium concentration only exceeded GSI protection criteria, Blaine discussed with Brad at NTH and they decided not to resample or do an SPLP. Ryan was instructed to remove an additional foot of underlying soil from this location and it was backfilled with sand.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/9/2018

General pictures from today's site visit

Area from today's verified points

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/10/2018

Time Arrived: 9:45 Time Left: 11:45 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 58 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Sand and topsoil continued to be delivered to the site today. A fourth lift of sand was placed on the north half of Pond 3 and Pond 2 as a whole. After density tests were taken and considered passing one operator via dozer placed topsoil on these verified areas and graded it. Ryan had the east wall of Pond 1 further excavated and found some ash outside of the current documentation grid limits. Rob would like Jane and Blaine to discuss whether to continue chasing the ash or to stop at the current limits.

Summary of CQA Activities

Site visit and observation of construction activities. Used the Troxler density gauage to take density recordings on the north portion of the fourth lift placed in Pond 3 - all three recordings passed. Took two additional density testings in Pond 2 on the third lift of sand - both passed as well.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/10/2018

General picture from today's site visit

Ash found outside of limits

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/11/2018

Time Arrived: 10:00 Time Left: 10:35 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 44 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan dug several test pits with the excavator earlier with Blaine present to determine if ash was present outside of the current CCR limits. CCR materials not related to CCR pond operations were found to be used as pipe backfill over the snowmelt lines and as subbase fill under a former gravel parking and work pad constructed east of the CCR ponds. The pad and snowmelt line had been covered with topsoil and supports vegetation. Ryan continued to have sand/topsoil delievered and they continued to lay it on verified areas via dozer. They do not plan to work tomorrow and hope to do additional test pits further off the CCR boundaries to determine the extent of the ash, once they are certain of where the utilities in the area lie.

Summary of CQA Activities

Site visit and observation of construction activities. Blaine was present while Ryan dug two test pits earlier in the morning. Samples were taken at each pit and test pit 2 was observed under the microscope and determined to be purely ash. Both samples were delivered to ALS for total and SPLP of metals.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/11/2018

General picture from today's site visit

East edge of the current Area of CCR removal limits

View of Test Pit 2

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/14/2018

Time Arrived: 1:10 Time Left: 1:40 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 66 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan continued to place sand backfill on verified areas via dozer. They will have two visual points accessible tomorrow, however the rest of the points are still under CCR material. At time of visit they were waiting to hear whether they would have to chase the ash found in the berm outside of current CCR limits.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/14/2018

General picture from today's site visit

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/15/2018

Time Arrived: 9:40 Time Left: 12:05 Page: 1 of 1

Weather: Cloudy Precipitation: Rain earlier in day Temp: 63 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Ryan has cleared up to the eastern edge of the current CCR boundaries via excavator and dozer. John followed along the berm with the excavator, digging several test pits to determine the CCR boundaries along the berms. After digging the test pits Ryan operators began to tear out the trees and topsoil on the north portion of the berm.

Summary of CQA Activities

Site visit and observation of construction activities. Had John dig nine additional test pits along the berms. Determined Test Pits 3, 4, 5, and 6 to have ash present - with the amount of ash becoming less the farther south we went. Test Pits 7, 8, and 9 were free of ash. Test Pits 10 and 11 had ash present as well. Based on the test pits, the CCR boundaries were updated on the testing grid, with more visual points added starting at Point 4200.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/15/2018

Eastern edge of current CCR boundaries

Overview of Test Pits done today

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/16/2018

Time Arrived: 2:47 Time Left: 4:47 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to have CCR material trucked off site. No sand or topsoil was delivered today. They started to excavate from the south working north within the newly found CCR area, where CCR material was historically used as construction backfill, via excavator and dozer. They plan to save and re-use the uncontaminated topsoil and clay.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4077, 4177, 4175, 4173, 4176, 4222, 4227, 4228, 4231, 4223, 4218, and 4067. Took a sample for ALS at point 4227 but did not drop it off - plan to tomorrow with additional samples. Looked at points 4173, 4176, 4177, and 4218 under the microscope. 4173 and 4218 were verified - asked John Johnson to further remove CCR from 4176 and 4177.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/16/2018






Excavation of CCR material in the newly added CCR area

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/17/2018

Time Arrived: 2:00 Time Left: 3:50 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 83 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to excavate CCR material via excavator and dozer. They had placed sand on the verified areas from yesterday and were placing topsoil on top of the sand backfill at time of visit by CQA. They further removed CCR from Points 4176 and 4177 a few inches.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4013, 4014, 4229, and 4232. Dropped four samples off to ALS by 5 pm (4013, 4014, 4232, and 4227 from yesterday). Observed at points 4176, 4177, and 4229 under microscope. Let John know that point 4229 needed additional excavating and that CQA would need to re-document the point.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/17/2018

Excavation of CCR material in the newly added CCR area boundaries

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/18/2018

Time Arrived: 11:30 / 1:45 Time Left: 11:50 / 2:45 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 68 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnson, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

(AM) Ryan had 2 operators on site using both dozers to continue grading the topsoil placed on verified areas. They could not get haul trucks for the CCR material today or tomorrow to take the material off-site.
(PM) Rob and John were present, using the excavator to excavate additional points in the area where CCR material was historically used as construction backfill. They do not plan to work tomorrow (Saturday).

Summary of CQA Activities

Site visit and observation of construction activities. Documented the verification of points 4033, 4044, and 4045. Point 4033 was delieverd to ALS for metals testing. Was not able to re-visit point 4229 due to water. Rob said they will continue to pump water out of the area over the weekend and revisit it Monday.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/18/2018

Overview of site from 5-18-18

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/21/2018

Time Arrived: 8:40 Time Left: 9:05 Page: 1 of 1

Weather: Cloudy Precipitation: Light drizzle Temp: 56 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to excavate the area where CCR material was historically used as construction backfill via excavator and dozer. They do not plan to have any new points ready for verification today due to expected rain. John asked EES to look at two samples under a microscope just to have an idea of what material needs to be excavated in the area - one sample was a light grey silt with peat layers; the second was a brown sandy topsoil.

Summary of CQA Activities

Site visit and observation of construction activities. Looked at two samples under microscope as requested by John. Both areas where materials were found required additional excavation.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/21/2018

Overview of site from 5-21-18

Materials observed via microscope at request of John.
Both needed slightly more excavating.

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/22/2018

Time Arrived: 11:20 Time Left: 12:05 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 58 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to have CCR material trucked out today. Total trucks for the day is estimated to be around six. They do not plan to have any points ready today due to rain yesterday and standing water on site. Some of their pumping equipment has been removed from site so they are limited in how much water they can pump each day. Plan for tomorrow was to verify some points, but their dozer broke down and they will have to get a new one to the site. John said he will keep EES up to date on what's needed.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/22/2018

Overview of site from 5-22-18

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/23/2018

Time Arrived: 9:25 Time Left: 4:40 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 51 °F

Personnel on Site

Owners: HBPW - Andrew Reynolds
Contractors: Ryan Inc. - John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to excavate CCR material from the area where CCR material was historically used as construction backfill. They have placed a layer of clay (reused), followed by sand and topsoil, on the points already verified/documented They had several points ready for documentation throughout various times of the day.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4225, 4230, 4226, 4229 (revisit), 4224, 4219, 4215, and 4220. Points 4224 and 4220 were delivered to ALS for metals testing right at 5 pm. Started gathering topsoil depths and elevations for the south portion of the CCR area points that were verified this spring and have already been covered with sand and topsoil. Observed the holes placed along the snowmelt lines under the supervision of Andrew. Surveyed their locations as 52320181-52320192 (12 holes total). Each hole was approximately 4.5' in depth. Gathered four random samples of the backfill over the snowmelt lines from the holes, and after looking at the samples under the microscope, it was confirmed each sample does have a soil-ash mix present to various degrees.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/23/2018



Holes over snowmelt lines

Overview of site from south fence





Pictures of CCR area under excavation

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/24/2018

Time Arrived: 9:30 Time Left: 1:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 81 °F

Personnel on Site

Owners: HBPW - Andrew Reynolds
Contractors: Ryan Inc. - John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to excavate CCR material from the area where CCR material was historically used as construction backfill. They have placed a layer of clay (reused), followed by sand and topsoil, on the points already verified/documented. They have several trucks delivering sand today, and plan to have additional points ready this afternoon. Each morning they are having to spend some time pumping the groundwater that is coming up to the surface over night before they begin excavating.

Summary of CQA Activities

Site visit and observation of construction activities. Documentation of Points 4216, 4213, 4212, and 4174. Started gathering topsoil depths and elevations for the northern portion of the CCR/coal area points that were verified last fall, but either had stockpiles or were not graded until this spring. Took utilities samples 1-4 and dropped them off to ALS for arsenic testing. Ryan will be excavting to the snowmelt lines utility easement but not within or past as the lines are active and cannot risk damage. Blaine asked John to have the middle of the site re-graded due to ponding water in several low spots.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/24/2018

CCR area under excavation

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/25/2018

Time Arrived: 9:30 Time Left: 10:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 82 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan continued to excavate CCR material from the area where CCR material was historically used as construction backfill. They have several trucks delivering sand today, and several trucks taking out CCR material today.

Summary of CQA Activities

Site visit and observation of construction activities. John said they will work on excavating surface material today and will not have any points ready for verification until Tuesday due to the holiday.

Notes:

Andrew and John were present while a vaccum truck dug holes to determine the exact locations of the snowmelt lines. John then surveyed the lines and e-mailed the northings, eastings, elevations, and descriptions to EES and the HBPW. They found four points along both of the 18" lines and only one point each along the 12" lines. Andrew said the HBPW would like Ryan to excavate up to 4' west of the lines. They would also like to stay west of the existing light pole out there, and then go directly towards the building from there for the eastern CCR area boundary.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/25/2018

Snowmelt lines

CCR area

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/29/2018

Time Arrived: 9:15 / 1:15 Time Left: 10:45 / 4:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 87 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

(AM) Ryan continued to pump surface water form the site and excavate CCR material. They started to re-grade the center of the site at a 1% slope/swale to help prevent ponding after storm events.
(PM) Ryan excavated the CCR area with me present so that samples and documentaiton could be made right away, before the area filled back up with water. They then used the dozer to immediately place sand backfill on the documented area. They excavated up to 4' west of the snowmelt lines, and then at a radius up until the light pole.

Summary of CQA Activities

(AM) Site visit and observation of construction activities. Hand augered down 1.5' at Points 4208 and 4211 to grab samples for metals testing by ALS. Delivered the samples to ALS by noon.
(PM) Verified points 4221, 4217, 4214 (sample), 4210, 4209 (sample), and 4172 (sample). Point 4214 was documented/sampled 4' west of the point due to it being located within the snowmelt lines. Dropped off three samples to ALS by 5.

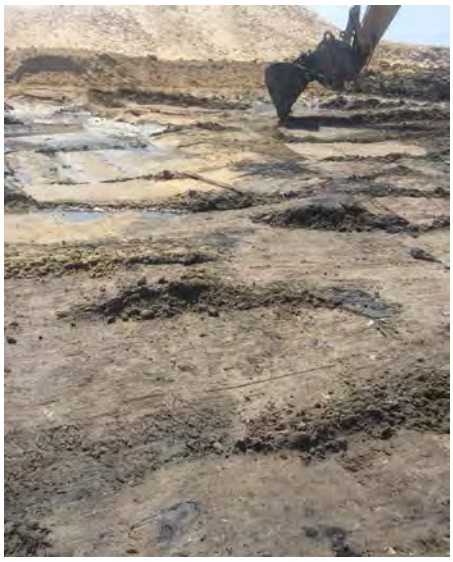
Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/29/2018



CCR area under excavation

Re-grading of the middle of the site via dozer

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/30/2018

Time Arrived: 2:00 Time Left: 5:00 Page: 1 of 1

Weather: Clear Precipitation: Some light rain Temp: 84 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - John Johnson, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to pump surface water from the site and excavate CCR material. During the morning Ryan pumped water and cleared surface CCR material. In the afternoon Ryan excavated the CCR area further while I was present to the underlying natural soils so that samples and documentaiton could be made right away, before the area filled back up with water. They then used the dozer to immediately place sand backfill on the documented area. They didn't excavate any further than a line directly north from the light pole, at the request of Andrew.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4206, 4171, 4034, 4023, 4024, 4169, 4170, and 4204. The two samples taken (4204 and 4169) were dropped off to ALS on the morning of 5-31-2018.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/30/2018

CCR area under excavation

Verified CCR area backfilled with sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/31/2018

Time Arrived: 11:30 / 4:15 Time Left: 3:15 / 5:50 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 82 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

During the morning, Ryan pumped water and cleared surface CCR material. In the afternoon, Ryan excavated the CCR area further. Sand and topsoil were delivered and placed on the verified areas and graded with a dozer. They also demo'd and capped the abandoned portion of the snowmelt line after speaking with Andrew. They cut it with a chainsaw, placed a cap, then pulled the pipe out with a chain attached to the dozer.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4015 and 4168. Point 4200 was hard to reach at an elevation of 576 and filling back up with water, as it's below Lake Macatawa's water level of 581. Andrew said not to dig any deeper because there is a working sanitary line in that area. Andrew requested that I take a bag sample of the ash left in the ground and to leave the point as-is. Finished gathering topsoil depths/elevations for the points that had sand/topsoil stockpiled on them over the winter. Found a gray looking material at Points 246, 4146, and 4147 during soil depth measurements. Looked at it via microscope with Kurt and determined it to be a natural material.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 5/31/2018

After re-grading, site is ponding less after rain events

Area of excavation

Portion of the dead snowmelt line being demo'd

Natural material found at Points 246, 4146, and 4147 during soil depth measurements. Verified via microscope, that it is natural material.

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 6/1/2018

Time Arrived: 2:00 Time Left: 4:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 94 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - John Johnson, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

By time of visit Ryan had the majority of the excavated CCR material already trucked off site, and the last point (4201) excavated and ready for documentation. They continued to place sand and topsoil on verified areas. They left some CCR material used as pipe backfill or a parking area subgrade in the northeast corner of the site near the utilities, as they didn't want to excavate too closely to them.

Summary of CQA Activities

Site visit and observation of construction activities. Documented point 4201 and dropped a sample off to ALS. Took three additional density tests all located within the northeast corner of the site - all passed. Surveyed along the line where CCR material was left behind in the northeast corner. Blaine asked John to smooth out the grading on the entire site - lots of bumps were present.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 6/1/2018

Area of excavation

Edge of CCR left in place

Cap on snowmelt line

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 6/4/2018

Time Arrived: 9:00 Time Left: 12:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 64 °F

Personnel on Site

Owners:	HBPW - Andrew Johnson
Contractors:	Ryan Inc. - John Johnson, 1 operator
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Over the weekend Ryan finished placing/grading the sand and topsoil. They also re-placed the styrofoam and backfilled with soil the vaccum holes made to determine the location of the snowmelt lines. At time of visit the operator was working on making the edges of the site look nice using the skidsteer. They were having equipment taken off of the site, and they do not plan to seed until Friday.

Summary of CQA Activities

Site visit and observation of construction activities. Surveyed the eatern disturbed area boundary. Finished up topsoil elevation/depth survey.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 6/4/2018

Overview pictures of the site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 6/15/2018

Time Arrived: 9:20 Time Left: 10:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 65 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Summary of CQA Activities

Site visit to observe site after hydroseeding performed by Ryan on 6/13/2018.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

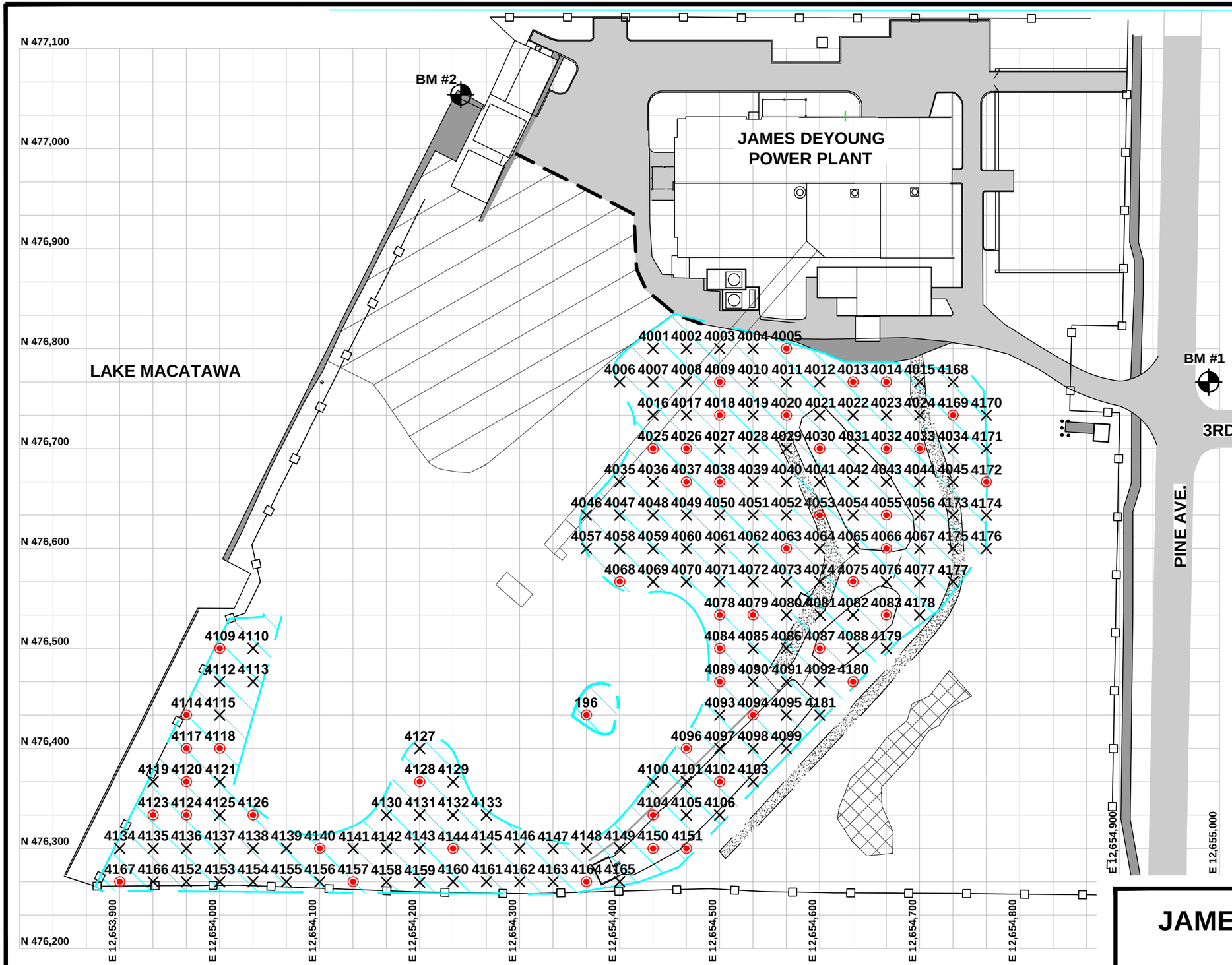
Progress Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 6/15/2018

Overview pictures of the site after seeding

APPENDIX B.1

CCR REMOVAL DOCUMENTATION



LEGEND

- LIMITS OF CCR MATERIAL
- EXISTING FENCE
- EXISTING BENCHMARK
- AREA OF CCR REMOVAL
- EXISTING LANDSCAPING

GRID NODES

- CCR AREA — 1
- CCR SAMPLE LOCATION — 1

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

DRAFT

JAMES DEYOUNG POWER PLANT

ASH REMOVAL DOCUMENTATION - GRID NODES

SCALE 1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET		1A	

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

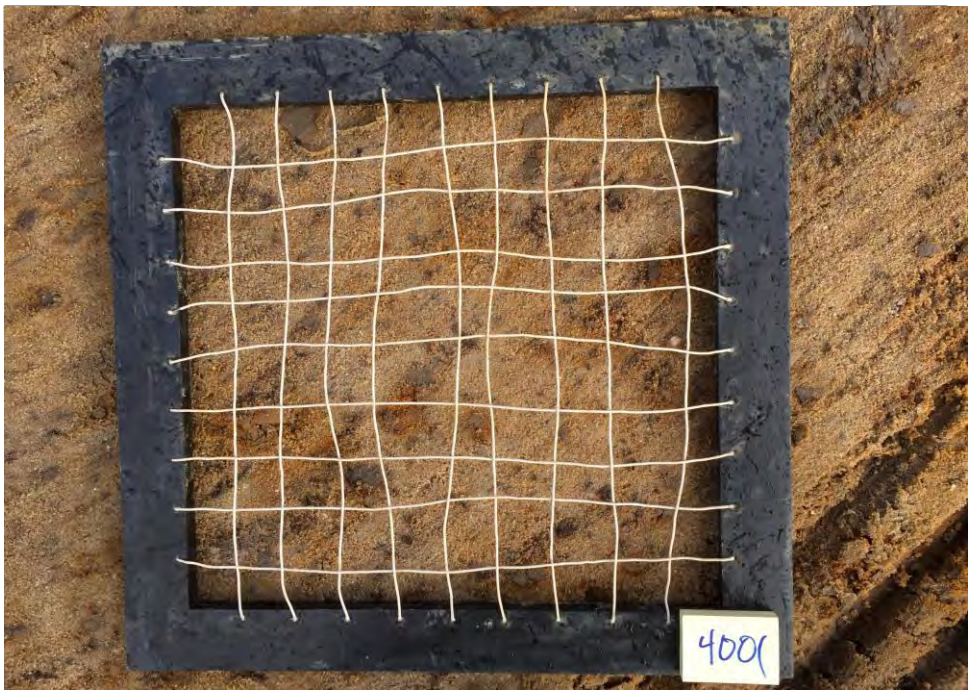
Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 196-2 (196-Retest)

Medium gray silty fine sand

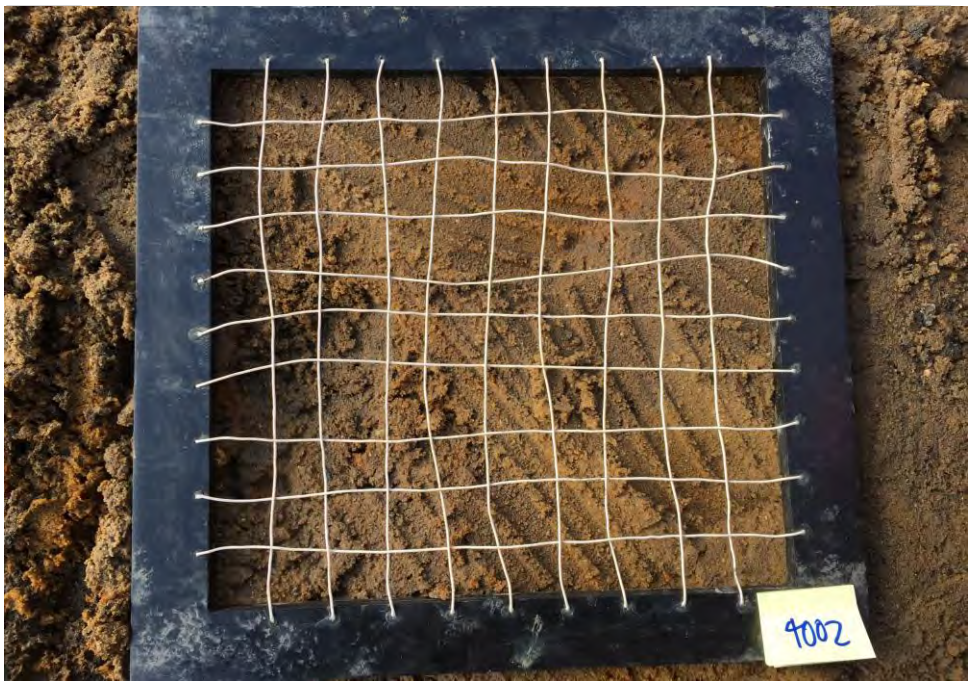
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4001, 4002



Brown silty fine sand

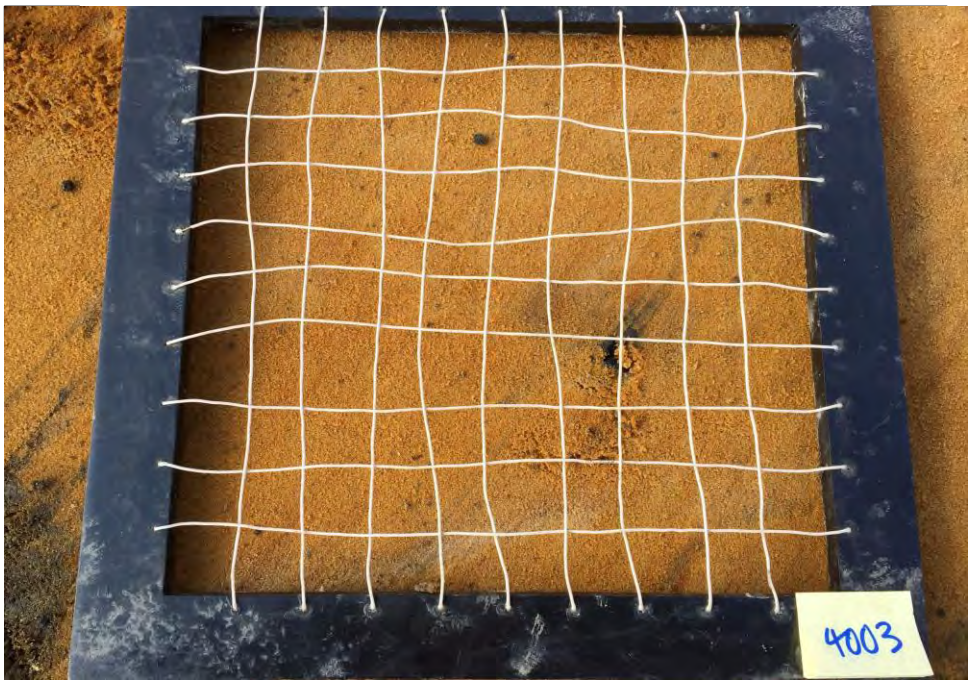


Brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4003



Orange silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4004

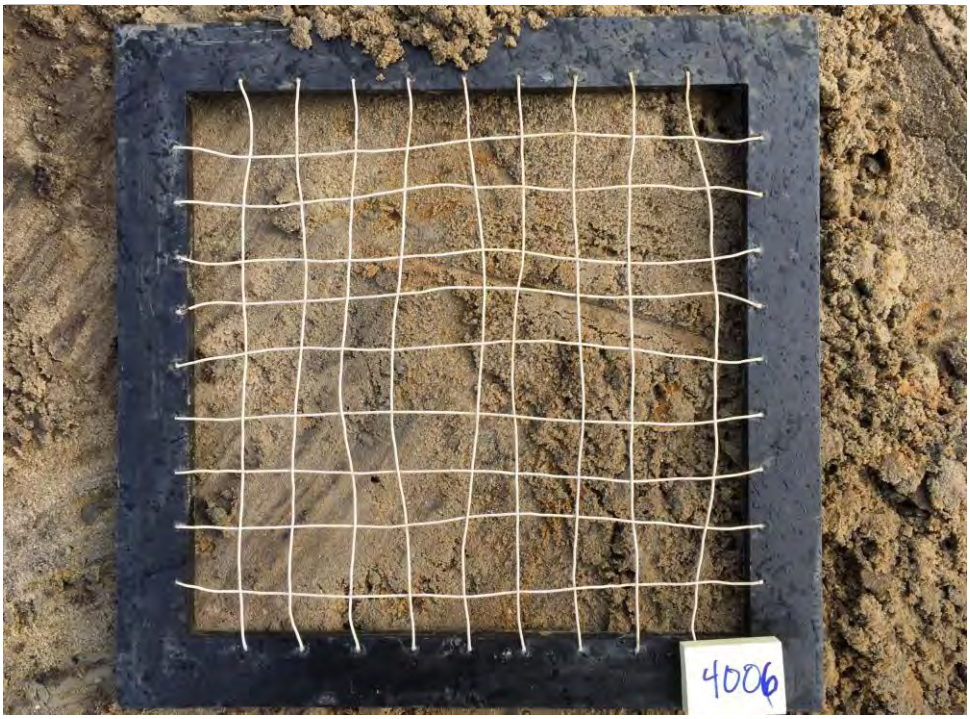
Orange-brown silty fine sand

Engineering & Environmental Solutions, LLC

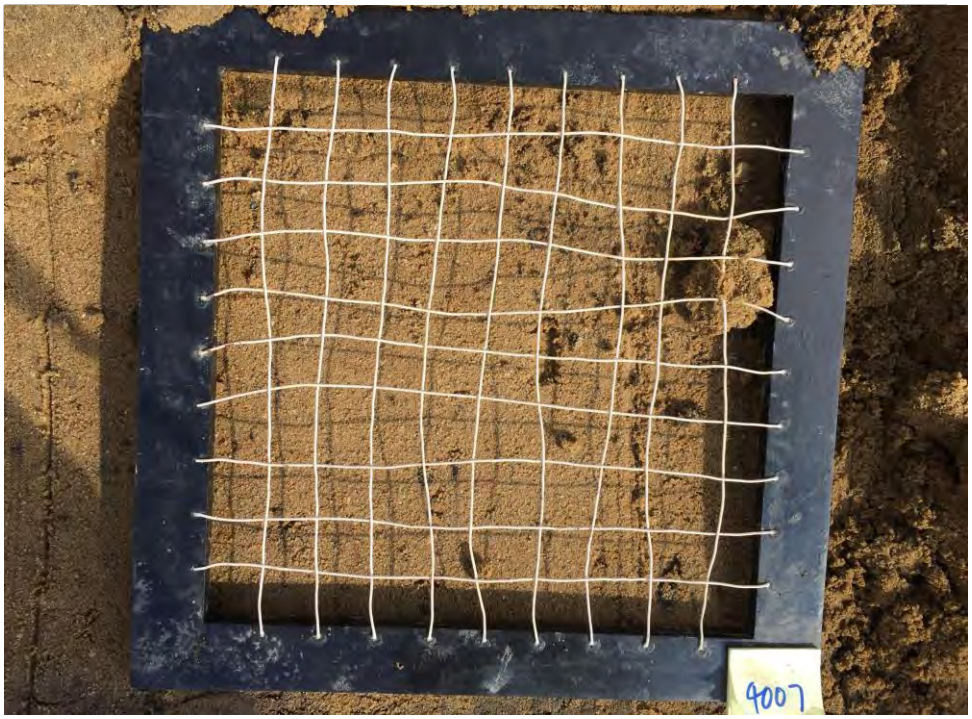
Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4005

Brown silty fine sand with trace clay

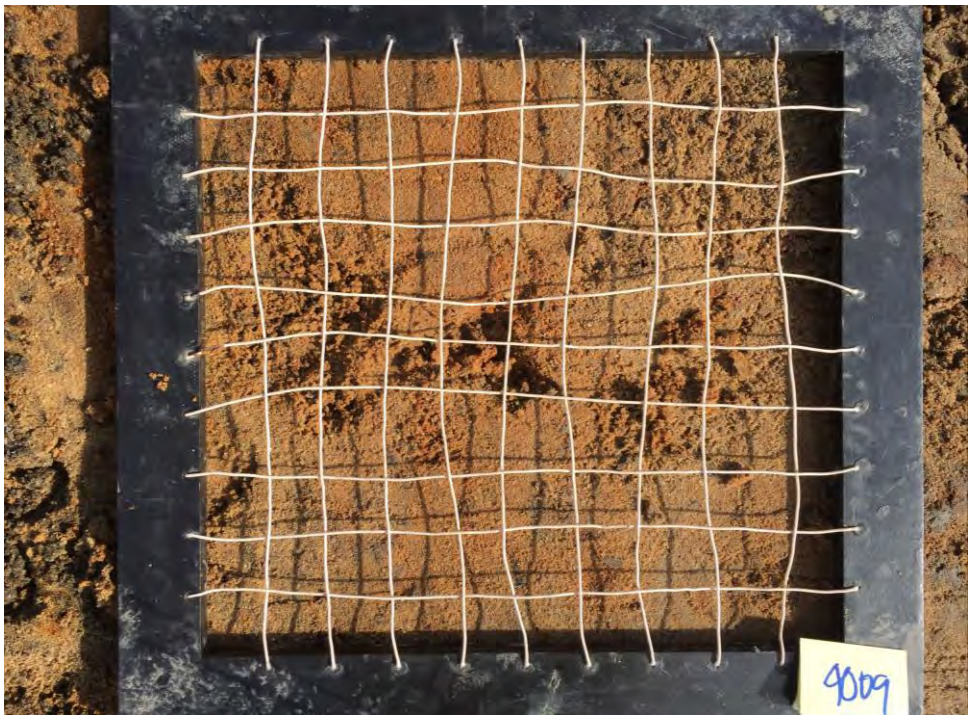


Light brown silty fine sand



Brown silty fine sand with trace fine gravel

Brown silty fine sand with trace fine gravel



Brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

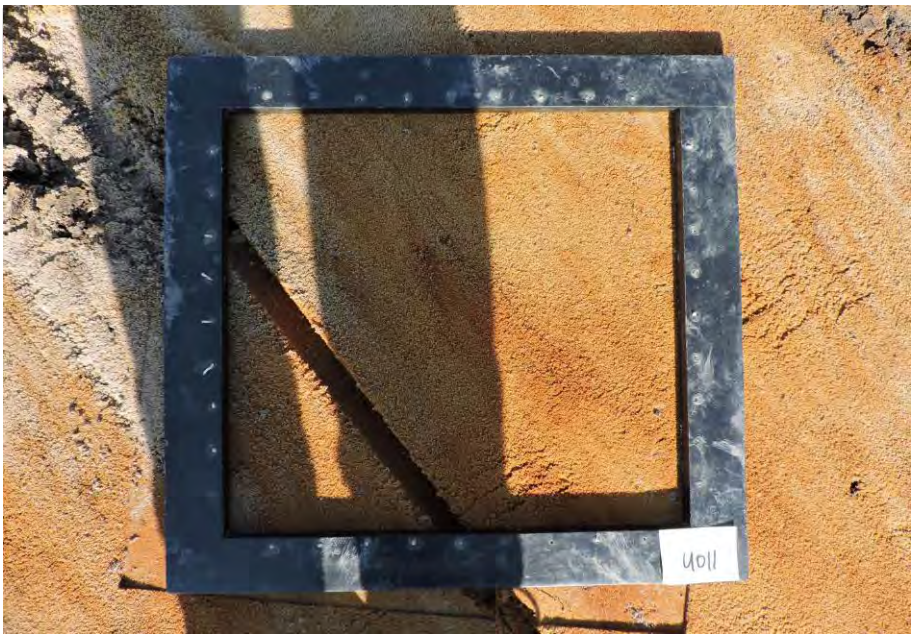
Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4010

Brown-orange silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4011



Orange silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4012

Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4013

Brown silty fine ssand with some gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4014

Dark gray silty fine sand with some gravel and shells and trace peat and clay

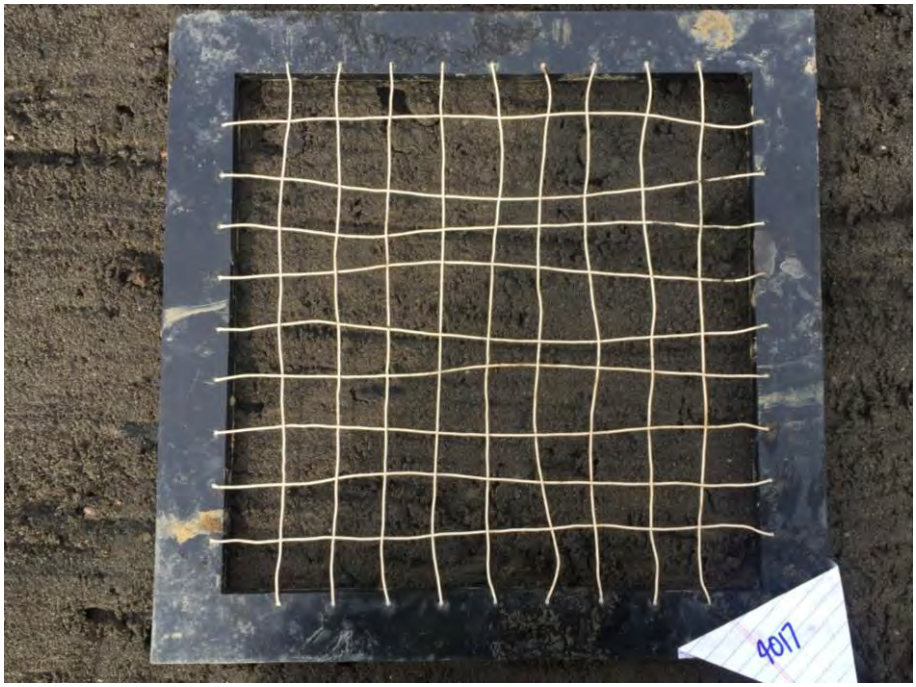
Gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

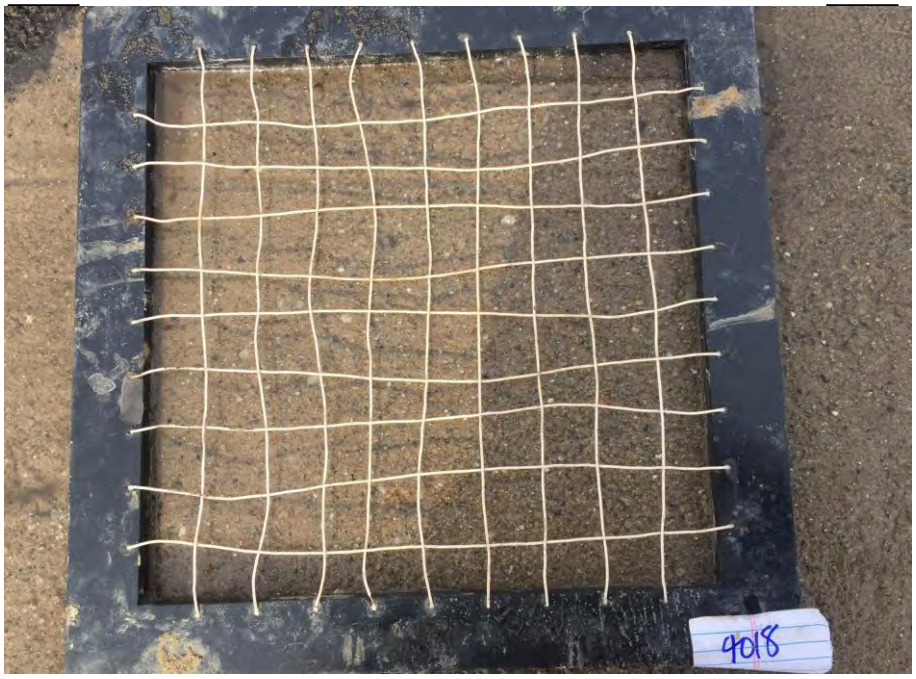
Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4016

Light brown silty fine sand



Dark brown silty fine sand with trace gravel



Light brown silty fine sand with trace fine gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4019

Brown-orange silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW CCR Impoundment System Closure Project No: 133-17-001 Points: 4020

Light brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4021

Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4022

Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4023, 4024

Gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

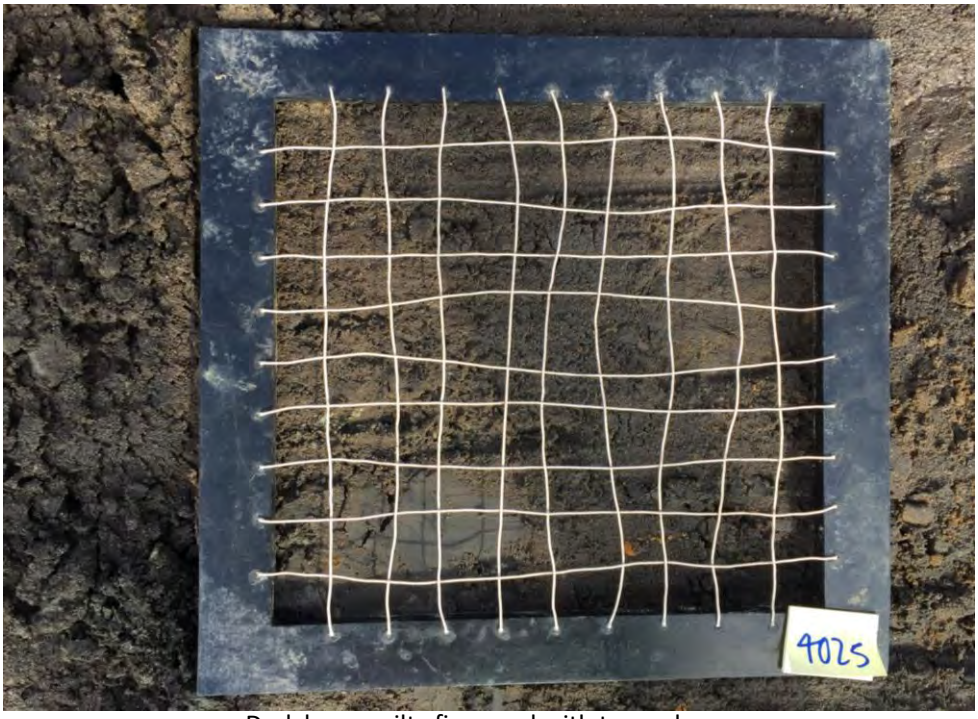
Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4024

Gray silty fine sand with trace clay and peat

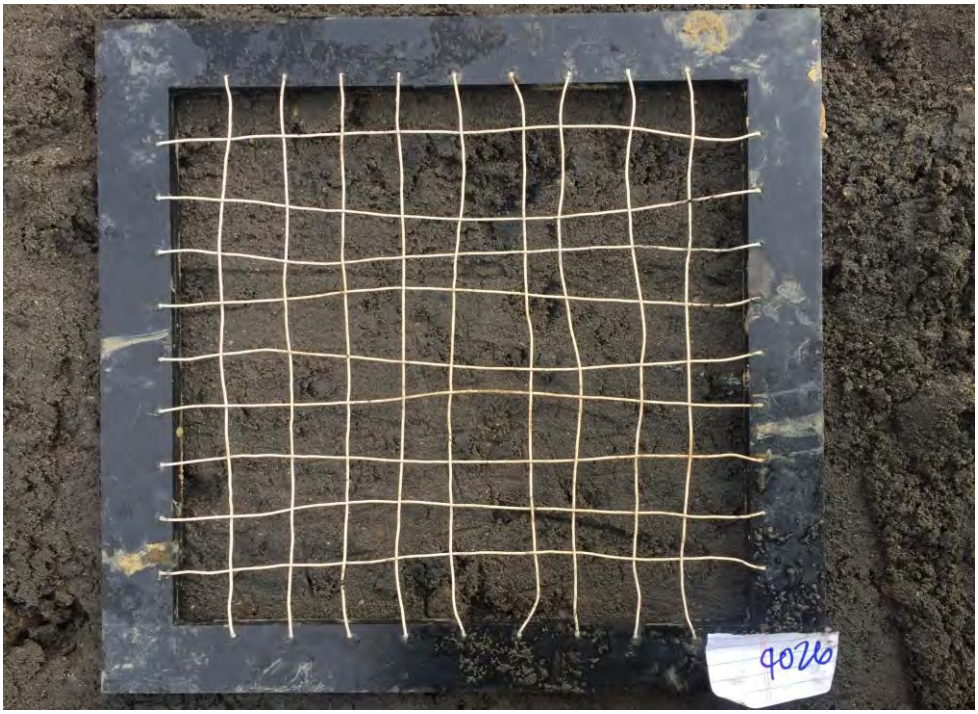
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4025, 4026



Dark brown silty fine sand with trace clay



Dark brown silty fine clay with trace gravel

Light brown silty fine sand with trace gravel

Brown silty fine sand

Light brown silty fine sand

Brown silty fine sand with some gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4031

Light brown silty fine sand with trace gravel and trace clay

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4032

Light brown silty fine sand with trace gravel and trace clay

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4033

Brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

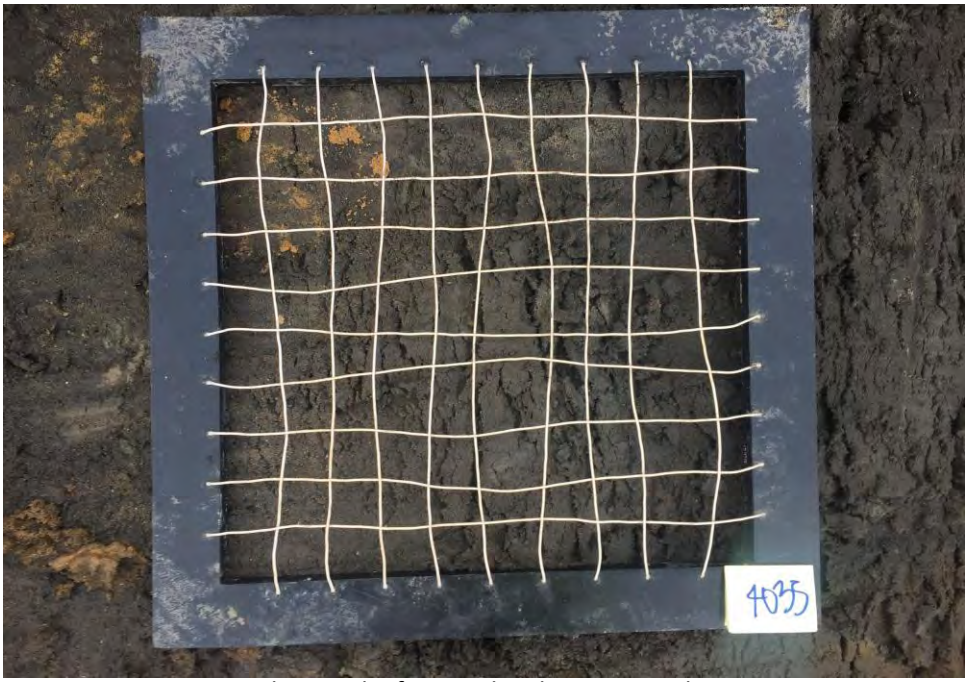
Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4034

Brown silty fine sand with trace gravel

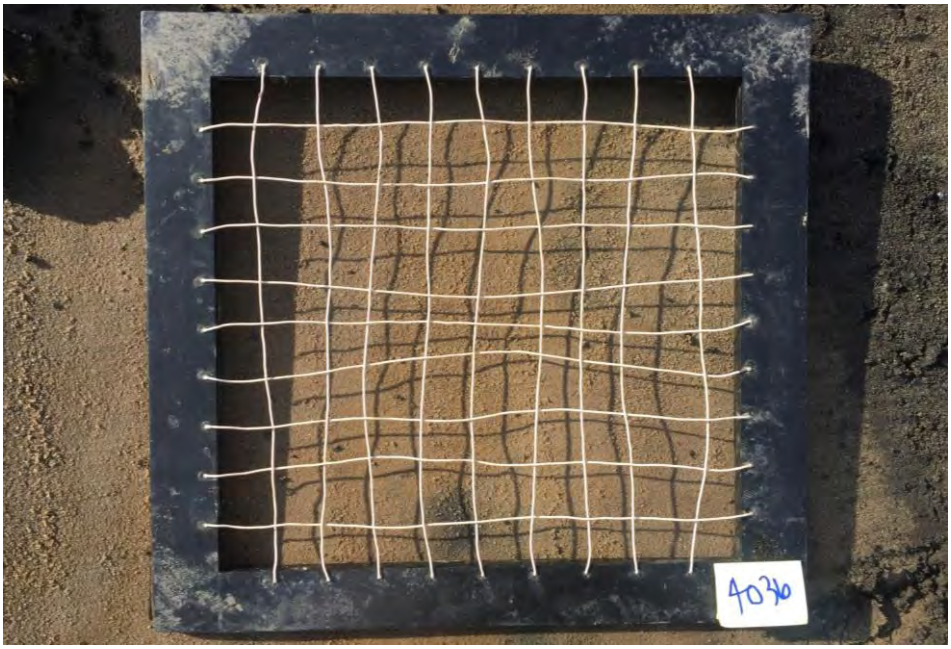
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4035, 4036



Dark gray silty fine sand with trace gravel



Light brown silty fine sand

Brown silty fine sand

Brown silty fine sand

Brown silty fine sand with trace peat and clay

Medium brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4041

Medium brown silty fine sand with some shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4042

Light brown silty fine sand with trace clay and roots

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

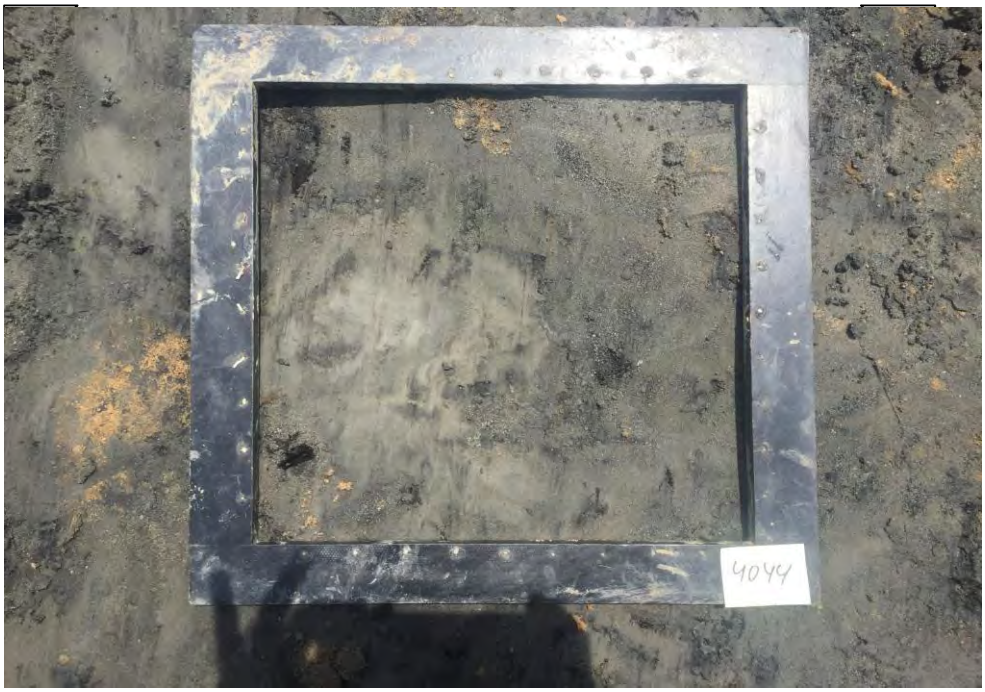
Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4043

Light-dark brown silty fine sand with trace clay and roots

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4044



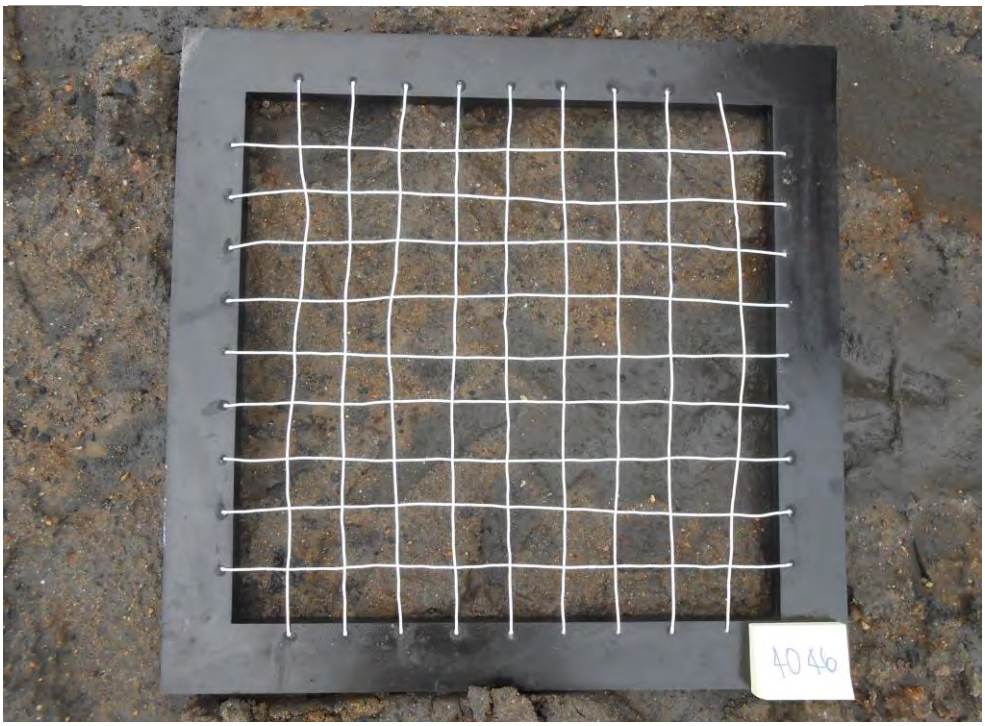
Gray silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4045

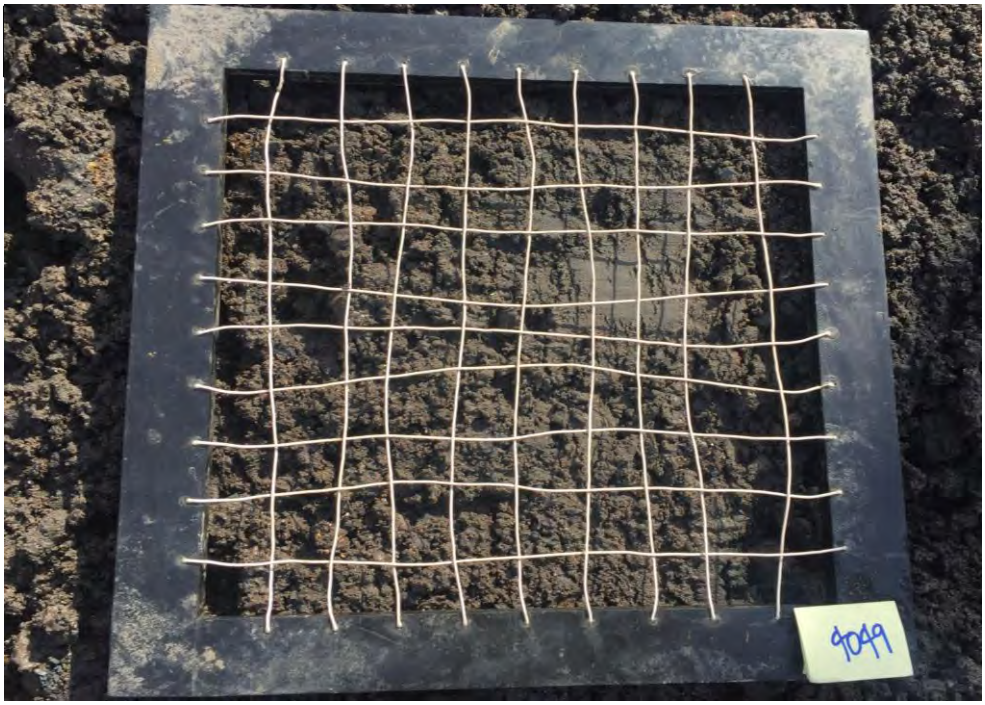
Brown silty fine sand with trace gravel



Variegated brown-dark gray silty fine sand with trace gravel and sticks

Variegated gray-brown silty fine sand with trace gravel and sticks

Dark gray silty fine sand with trace gravel and roots



Dark brown silty fine sand

Medium brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4051

Medium brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4052

Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4053

Light brown silty fine sand with little coarse gravel

Engineering & Environmental Solutions, LLC

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Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4054

Light-brown silty fine sand with trace shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

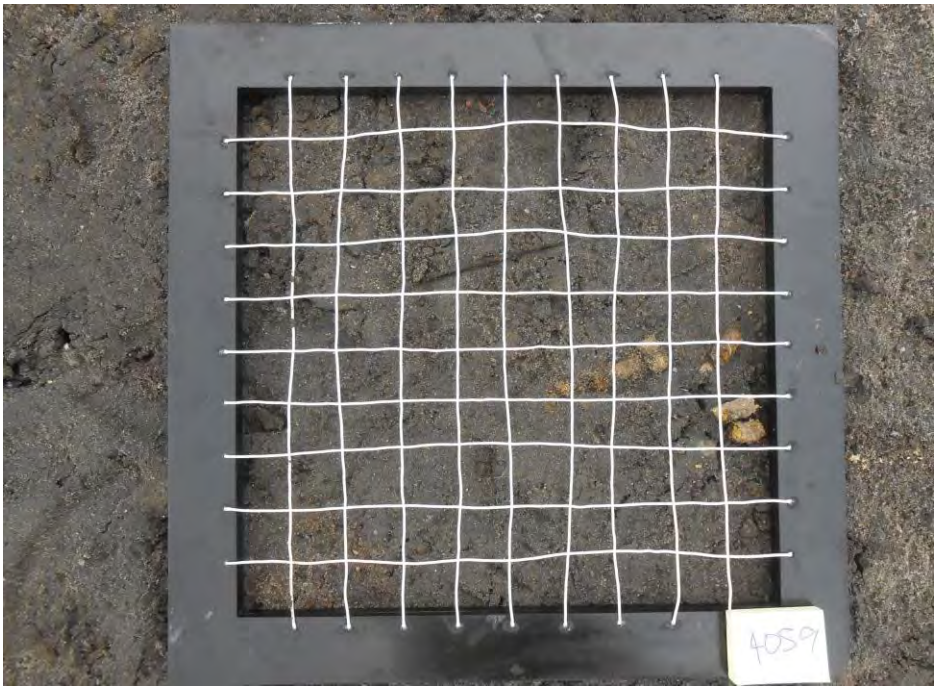
Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4055

Medium brown silty fine sand with trace shells

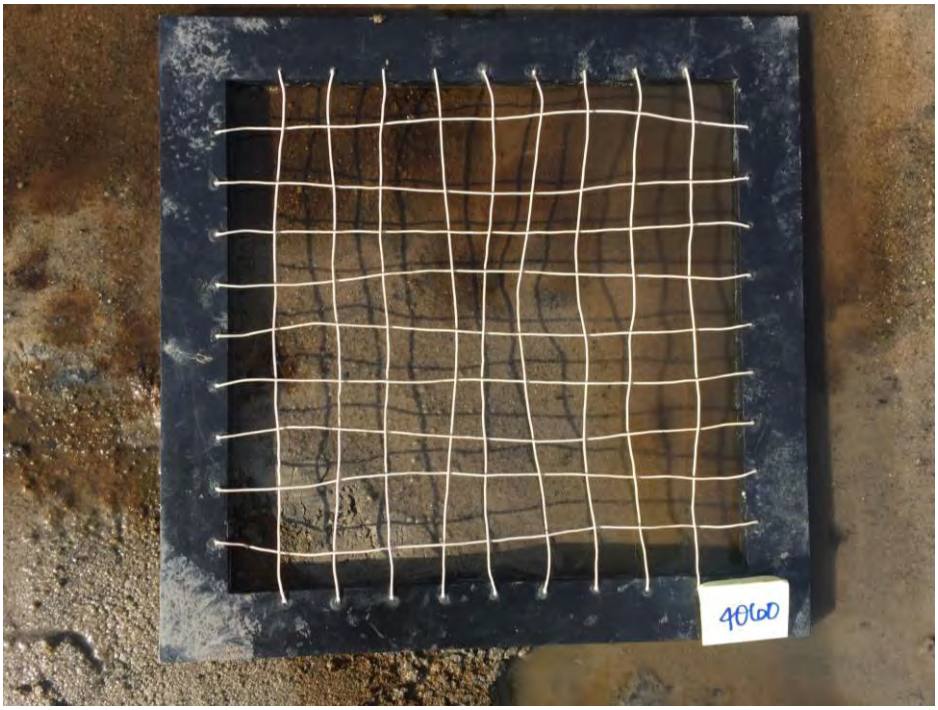
Light brown silty fine sand with trace gravel and shells

Variegated gray-brown silty fine sand

Variegated gray-brown silty fine sand with trace gravel and sticks



Dark gray silty fine sand with trace fine gravel roots and roots

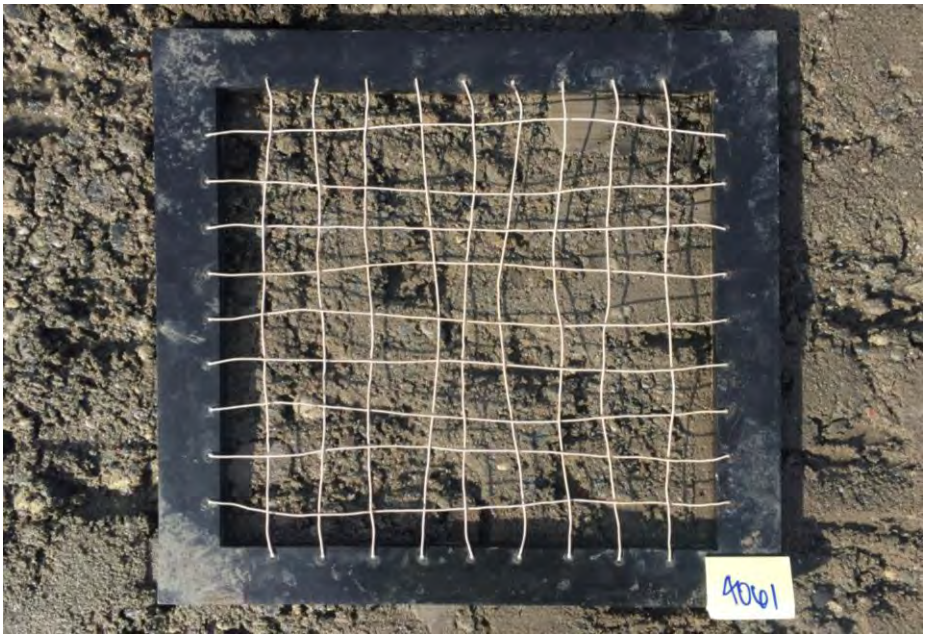


Variegated brown-orange silty fine sand with trace clay

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4061



Gray silty fine sand with trace gravel and clay

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4062

Medium brown silty fine sand with trace clay and shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4063

Light brown silty fine sand with some gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4064

Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4065

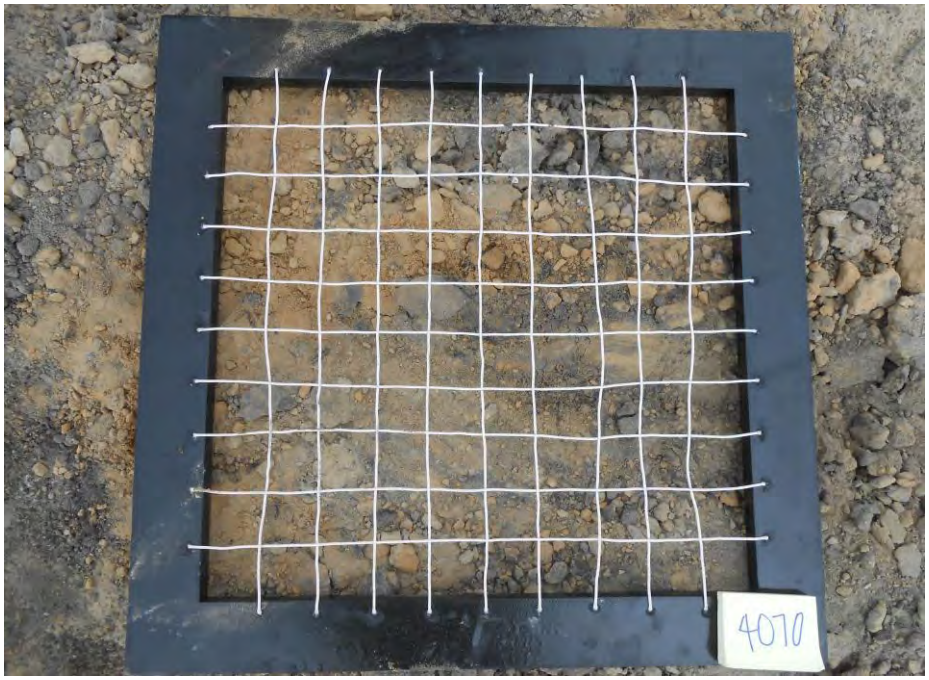
Light brown silty fine sand with trace gravel

Brown silty fine sand with trace clay

Brown silty fine sand

Gray silty fine sand with trace gravel and sticks

Variegated gray-brown silty fine sand with trace gravel and sticks

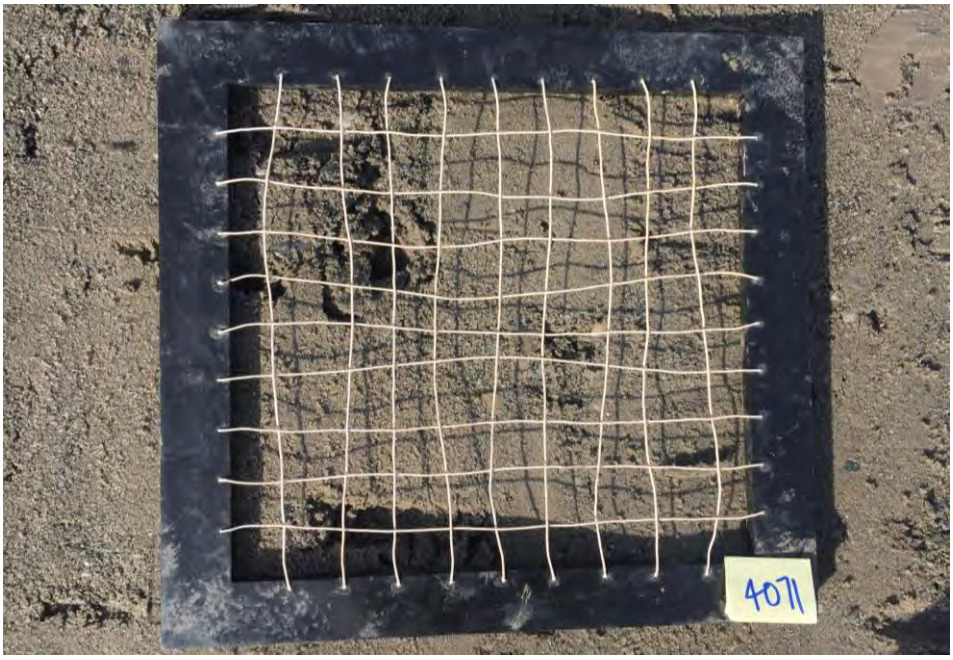


Variegated gray-brown silty fine sand with trace coarse gravel and sticks

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4071



Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4072

Light brown silty fine sand with some gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4073

Light brown silty fine sand with some peat and clay

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

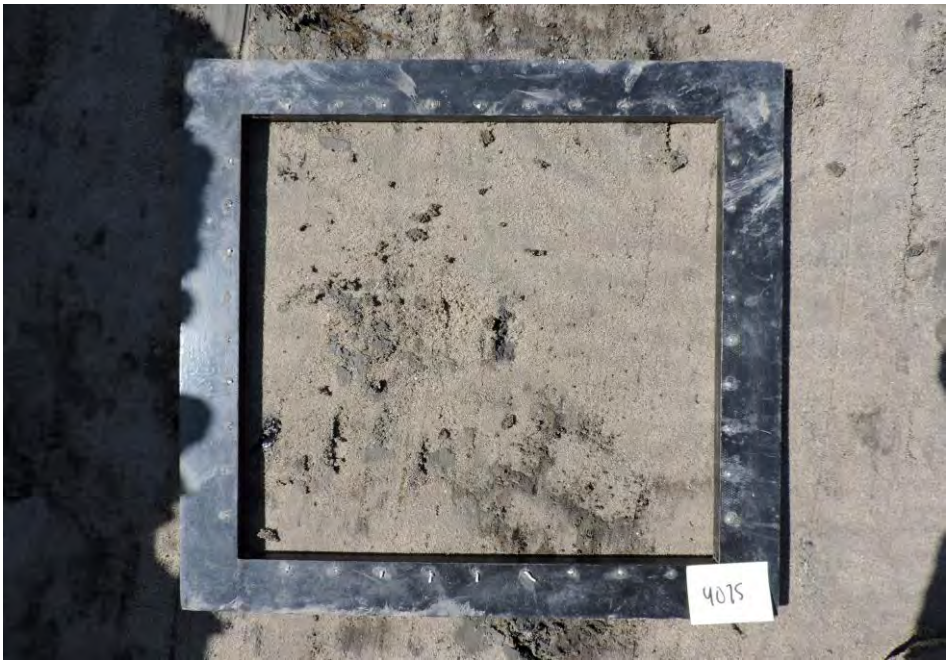
Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4074

Medium brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4075



Light brown silty fine sand

Light-dark brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4077

Medium brown silty fine sand

Variegated light gray-brown silty fine sand with trace gravel and roots

Light brown silty fine sand with trace clay

Medium brown silty fine sand with trace travel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4081

Light brown silty fine sand with trace peat and clay

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4082

Gray silty fine sand with some clay and trace peat

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

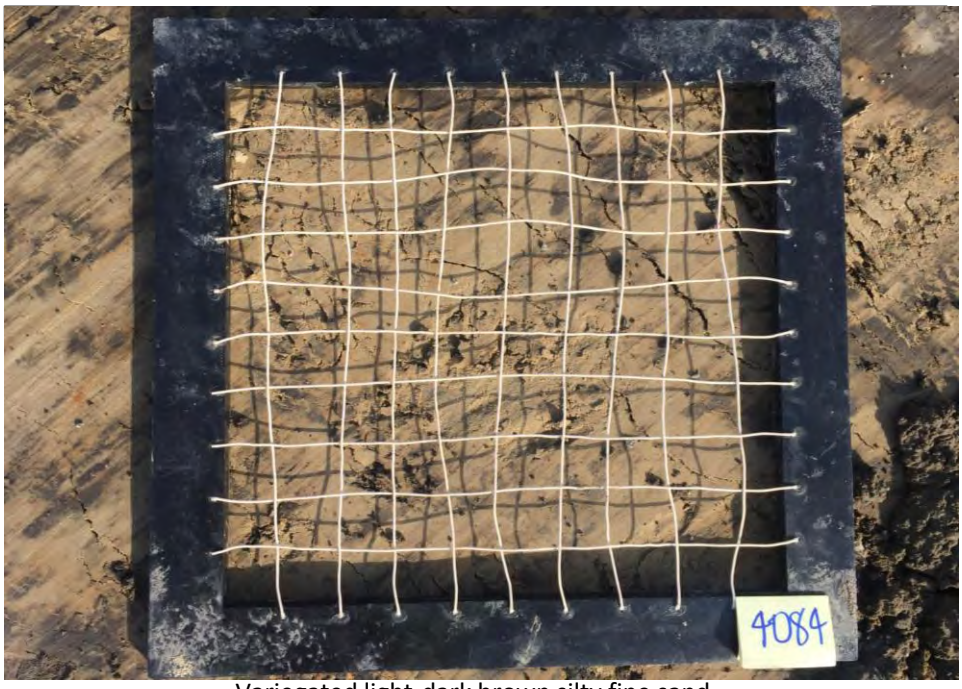
Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4083

Gray silty fine sand with some clay and trace peat

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4084



Variegated light-dark brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

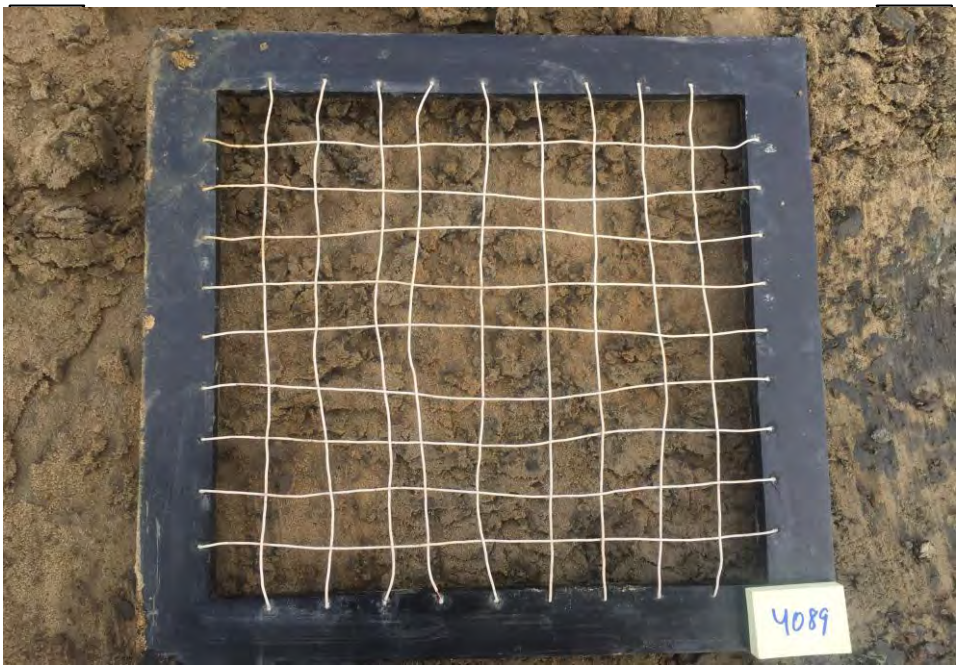
Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4085

Gray silty fine sand with some peat

Light brown silty fine sand

Gray silty fine sand with trace gravel and some peat

Brown silty fine sand with some clay and trace peat



Brown silty fine sand with trace clay

Medium brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4091

Light brown silty fine sand with trace gravel and roots

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

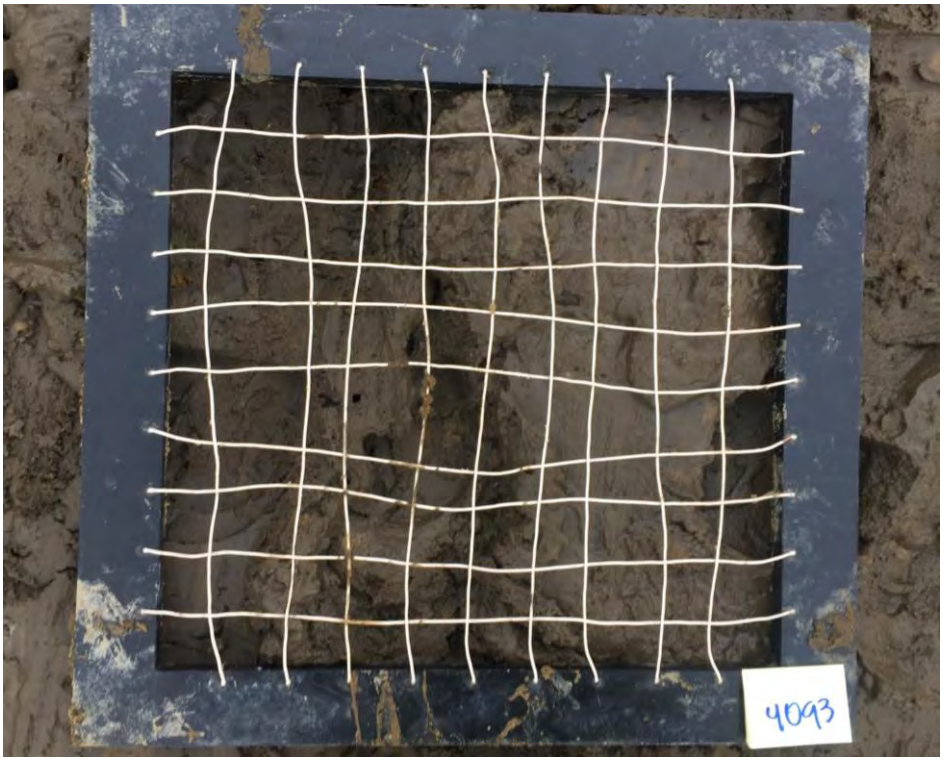
Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4092

Light brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4093



Brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4094

Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 4095

Brown silty fine sand with peat and trace shells

Variegated brown-orange silty fine sand

Light brown silty fine sand with trace gravel

Brown silty fine sand with trace gravel

Light-dark brown silty fine sand with some medium gravel

Variegated orange-brown silty fine sand

Variegated orange-brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4101

Gray silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4102

Medium brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4103

Dark brown silty fine sand with some gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4104

Brown-orange silty fine sand with peat layers

Engineering & Environmental Solutions, LLC

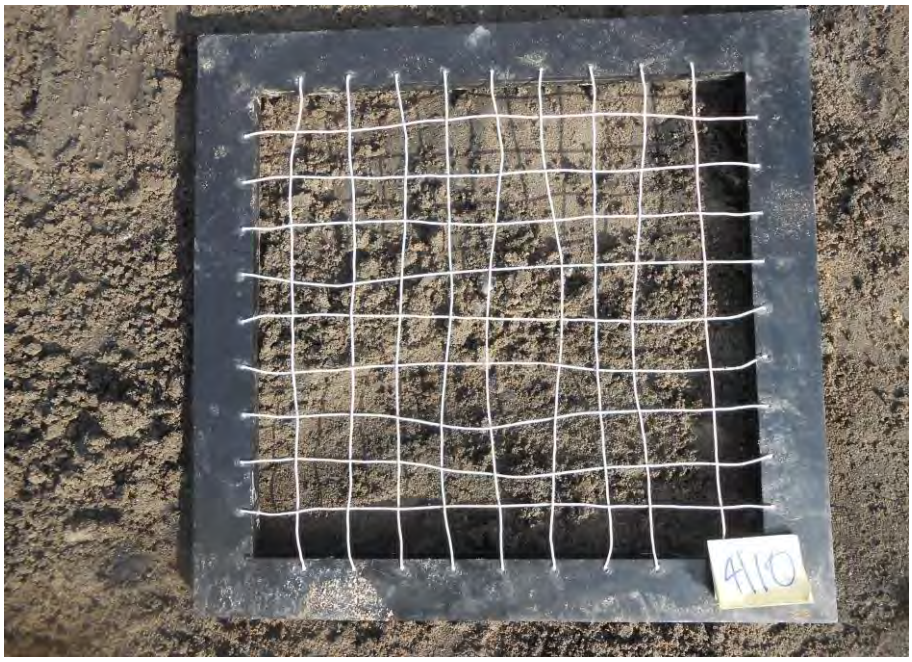
Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4105

Light brown silty fine sand with trace gravel

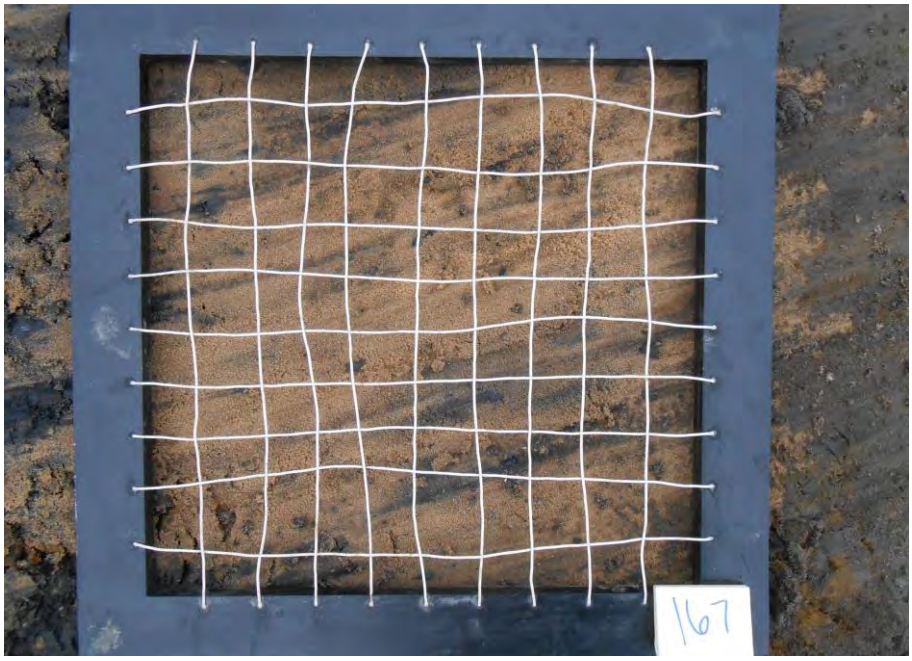
Brown silty fine sand with trace gravel, peat, and clay

Brown silty fine sand with trace gravel



Gray silty fine sand with trace gravel

Variegated gray-brown silty fine sand with trace gravel and clay

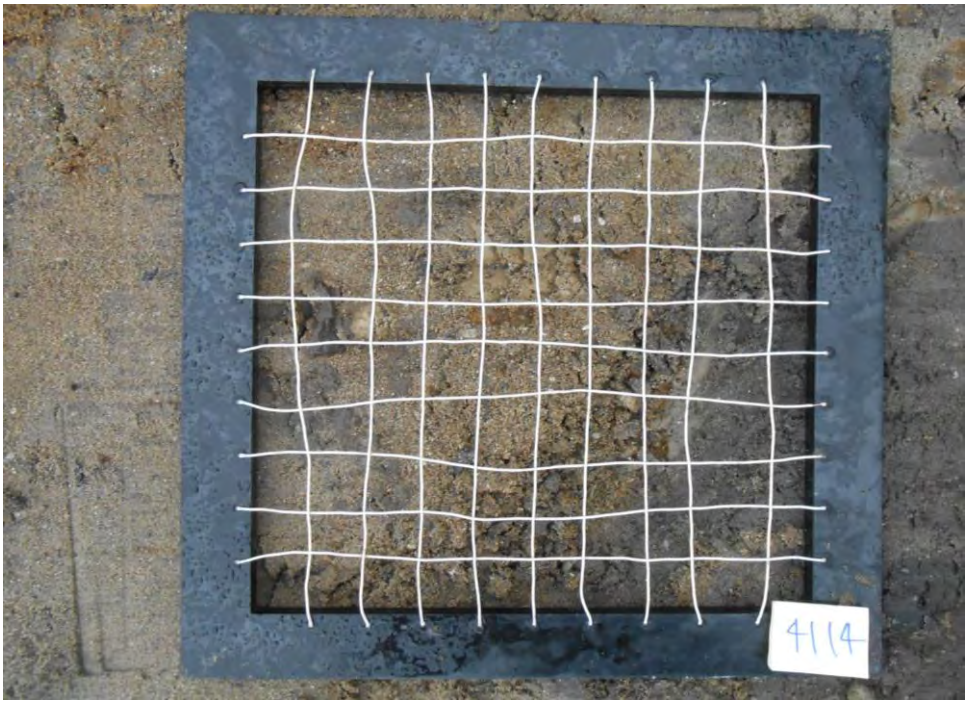


Variegated light brown-dark gray silty fine sand. *Point 167 was renumbered to 4113 during construction due to the location of the point being within ash boundaries.*

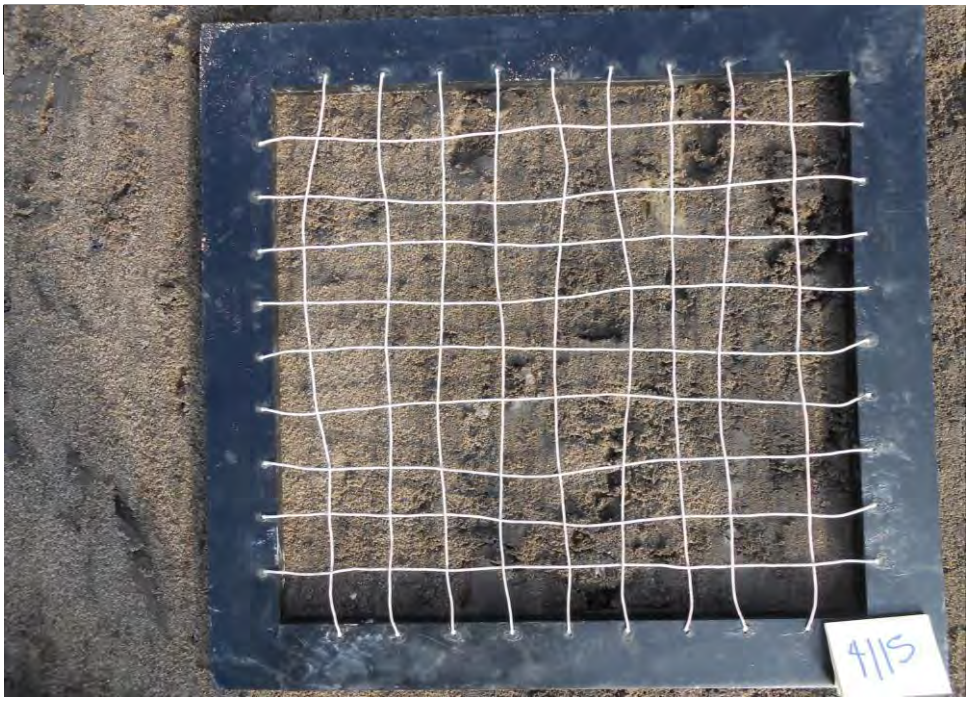
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4114
4115



Variegated gray-brown silty fine sand with trace gravel and clay

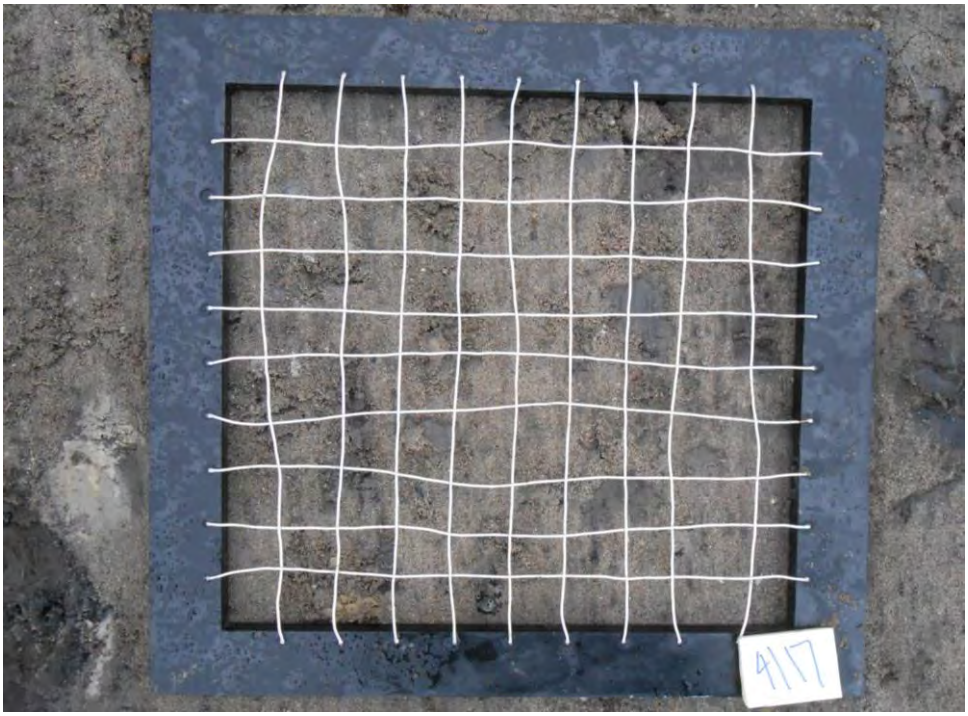


Gray silty fine sand with trace clay

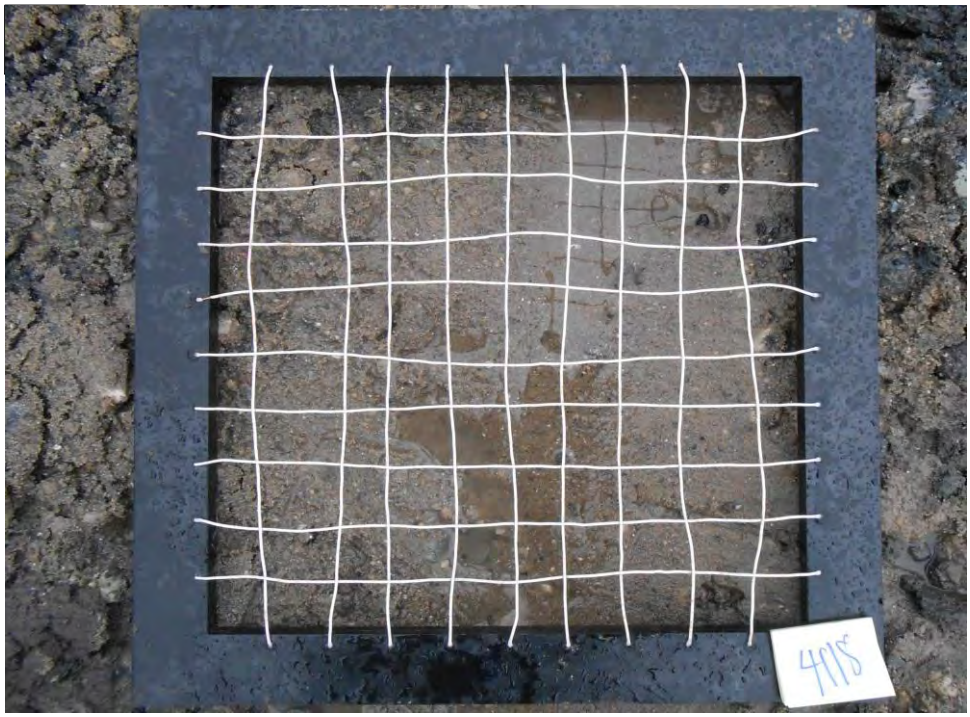
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4117
4118



Gray silty fine sand with trace clay

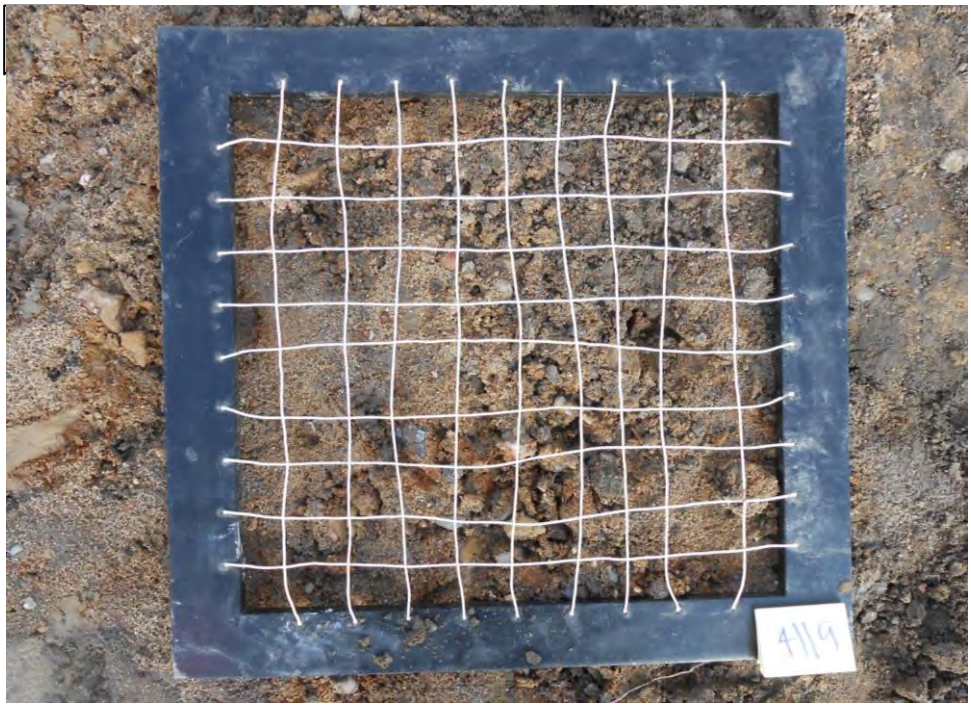


Variegated gray-brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4119, 4120



Variegated gray-brown silty fine sand with little gravel

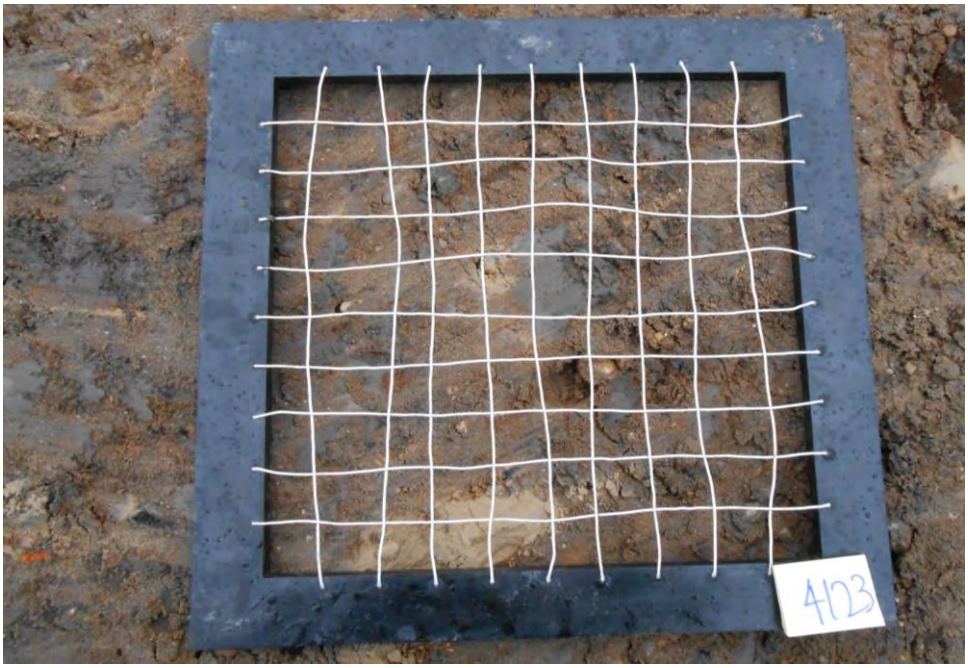
Variegated gray-brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4121, 4123

Gray silty fine sand with trace gravel

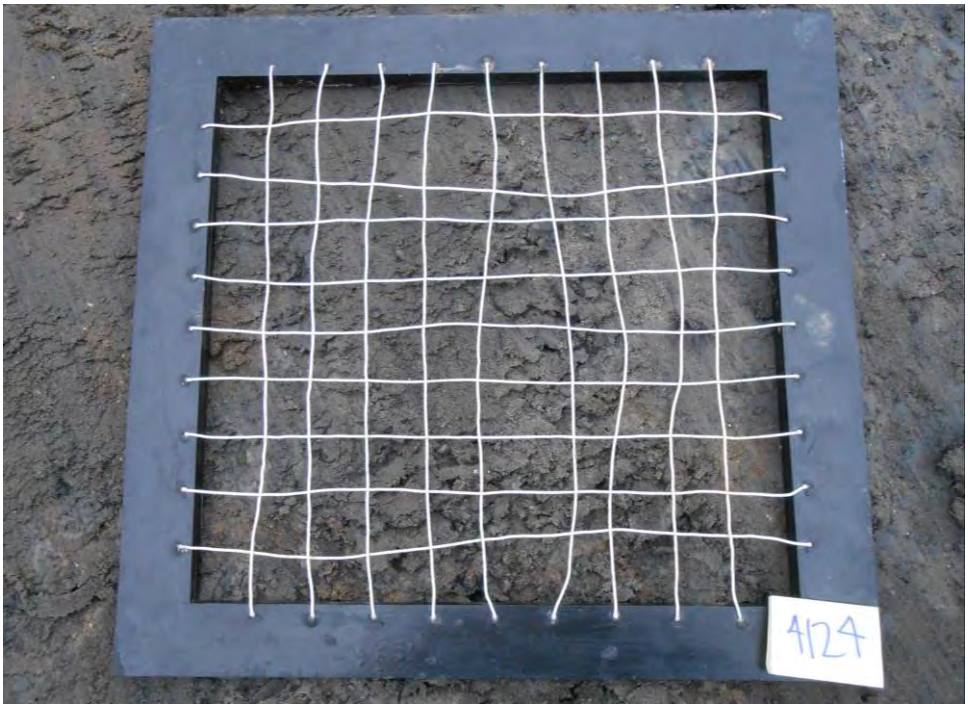


Variegated gray-brown silty fine sand with trace gravel and clay

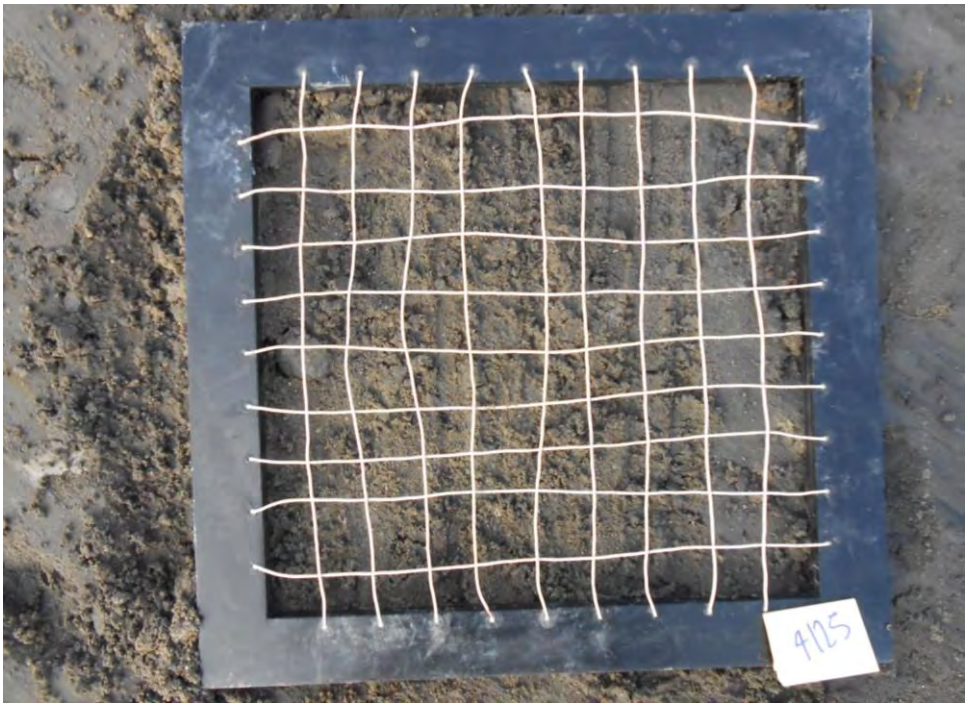
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4124, 4125



Gray silty fine sand with trace clay



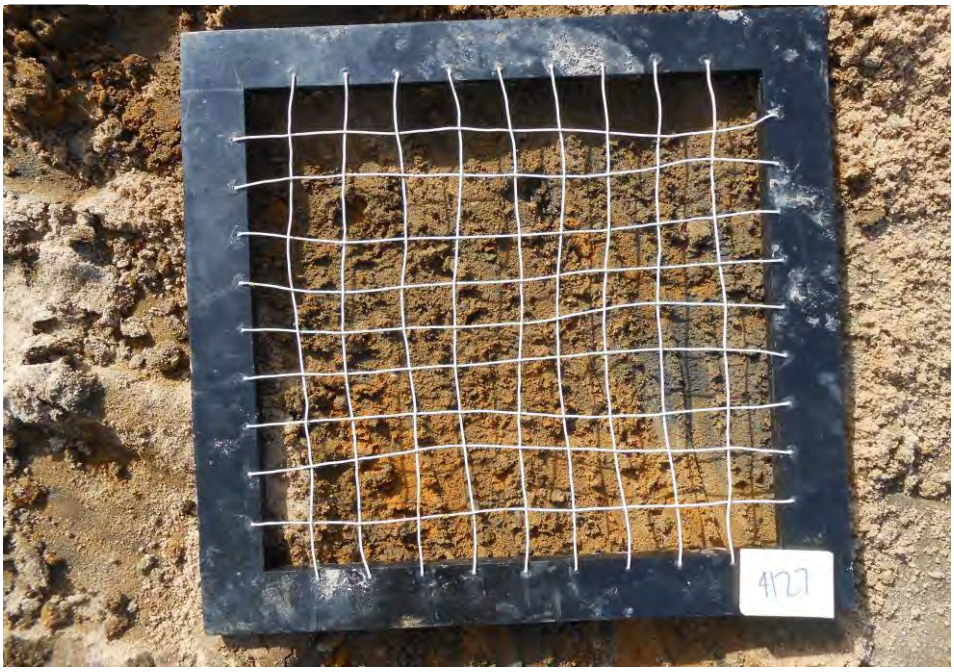
Gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4126, 4127

Variegated orange-light brown silty fine sand

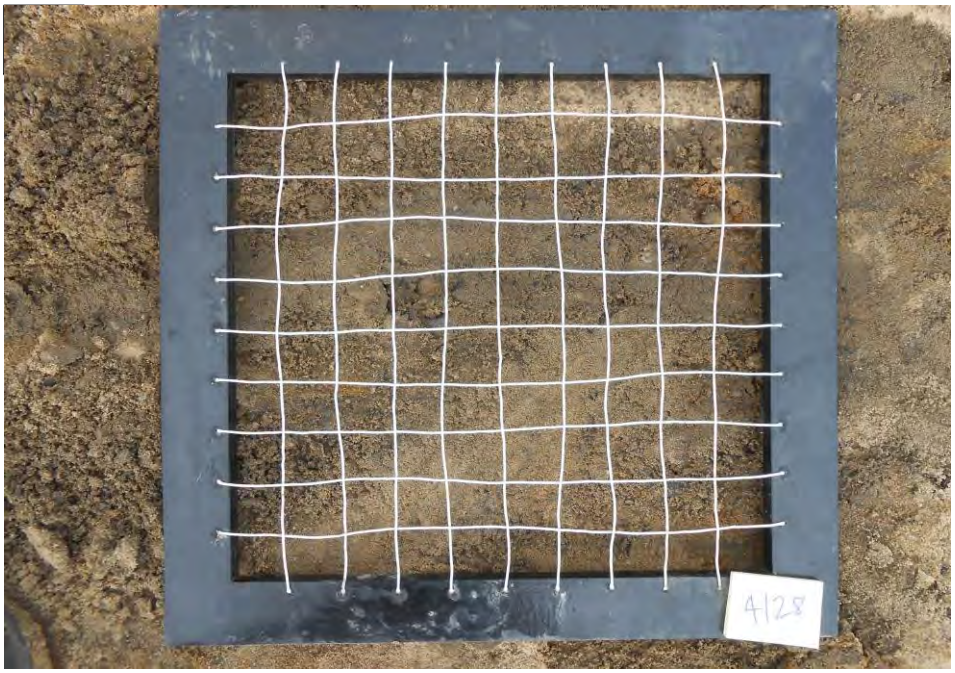


Brown silty fine sand with trace gravel

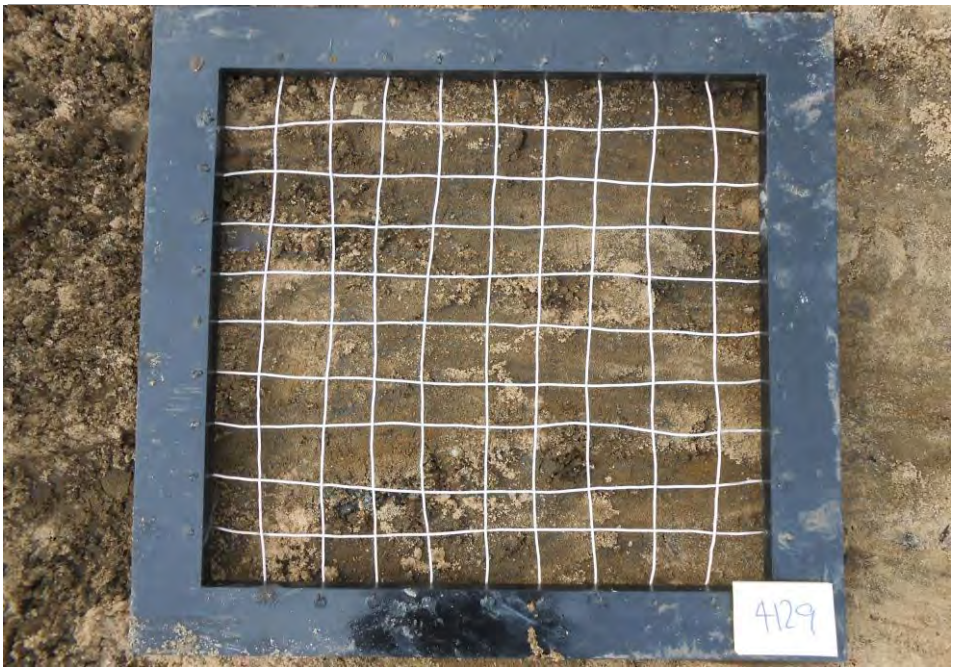
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4128, 4129



Brown silty fine sand with trace gravel

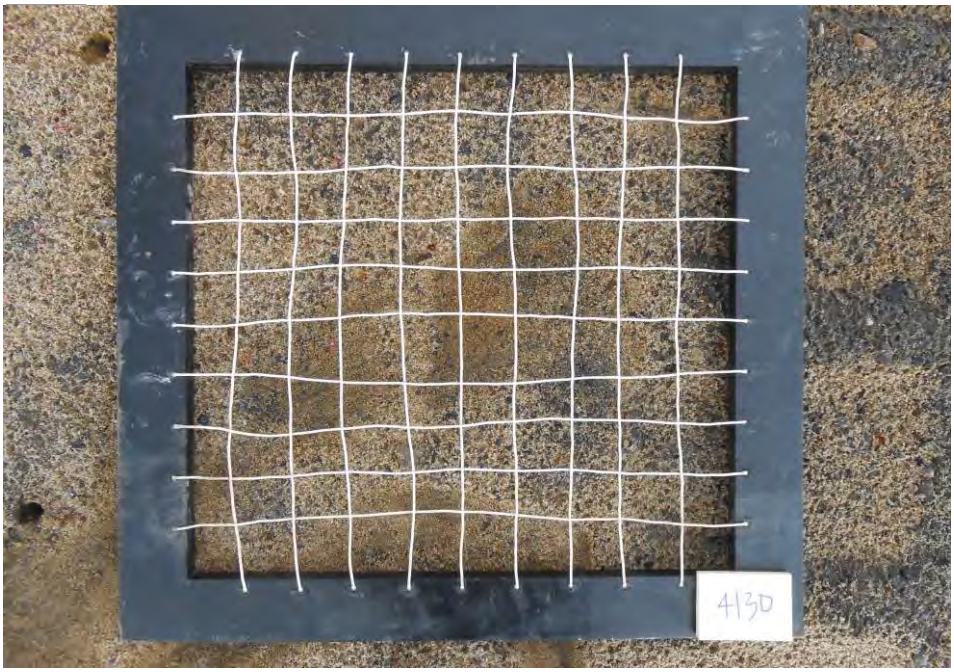


Variegated brown-dark gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4130, 4131



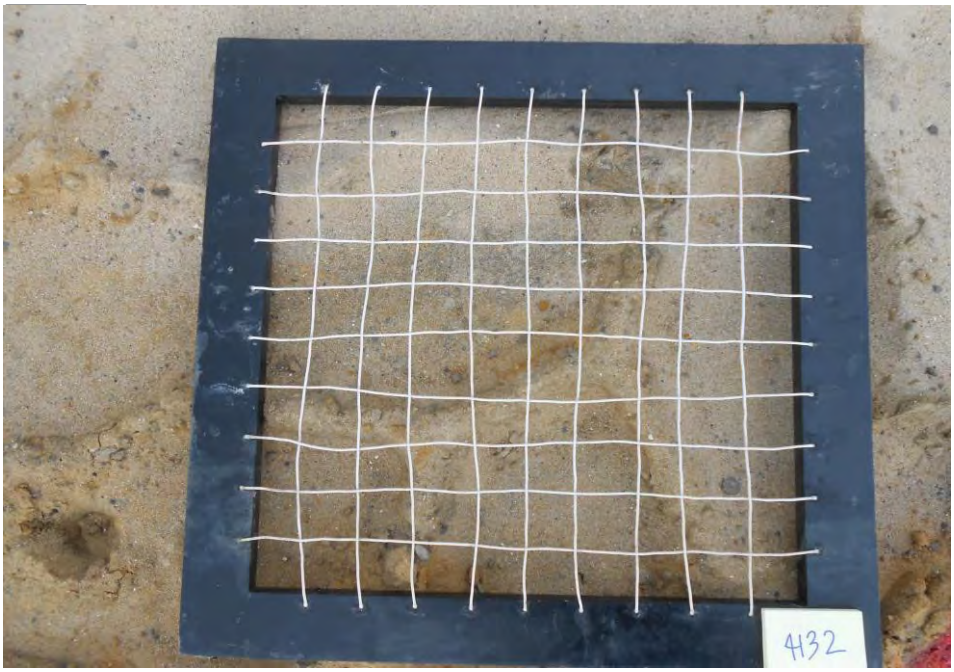
Variegated light brown-gray silty fine sand with trace gravel

Variegated light brown-gray silty fine sand with trace gravel

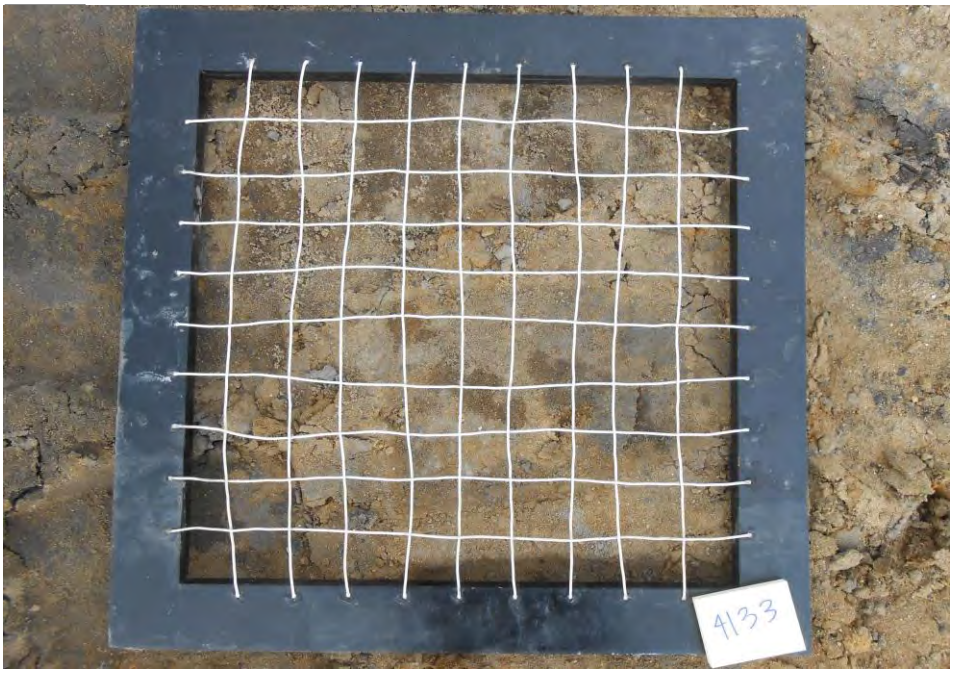
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4132
4133



Variegated light brown-gray silty fine sand with trace gravel

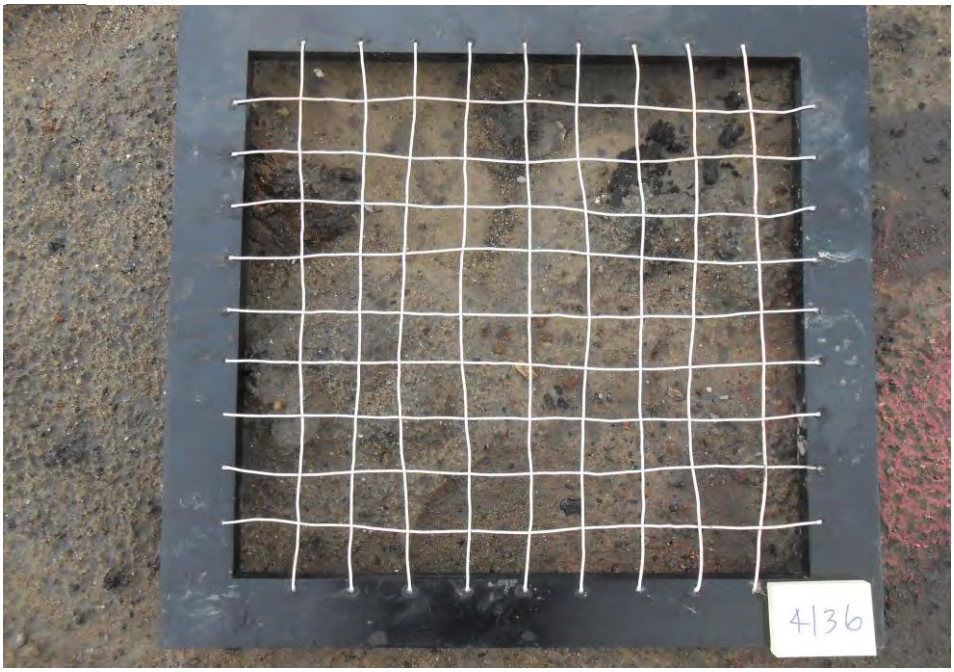


Gray silty fine sand with trace gravel

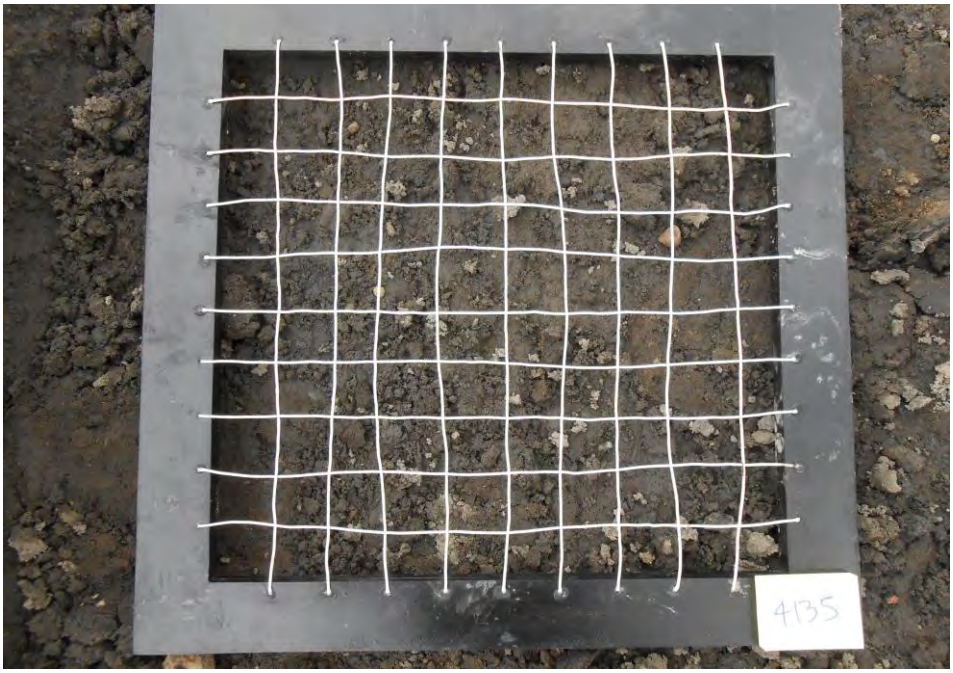
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4134, 4135



Variegated dark-light brown silty fine sand

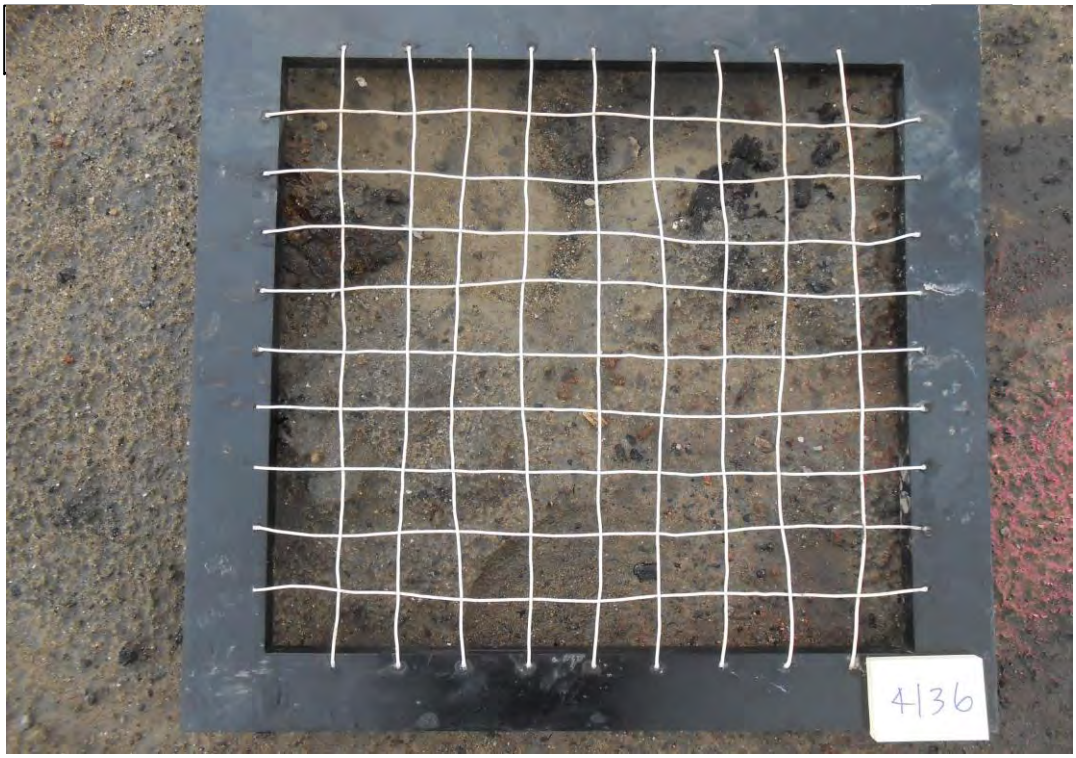


Dark gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4136, 4137



Light gray silty fine sand with trace fine gravel

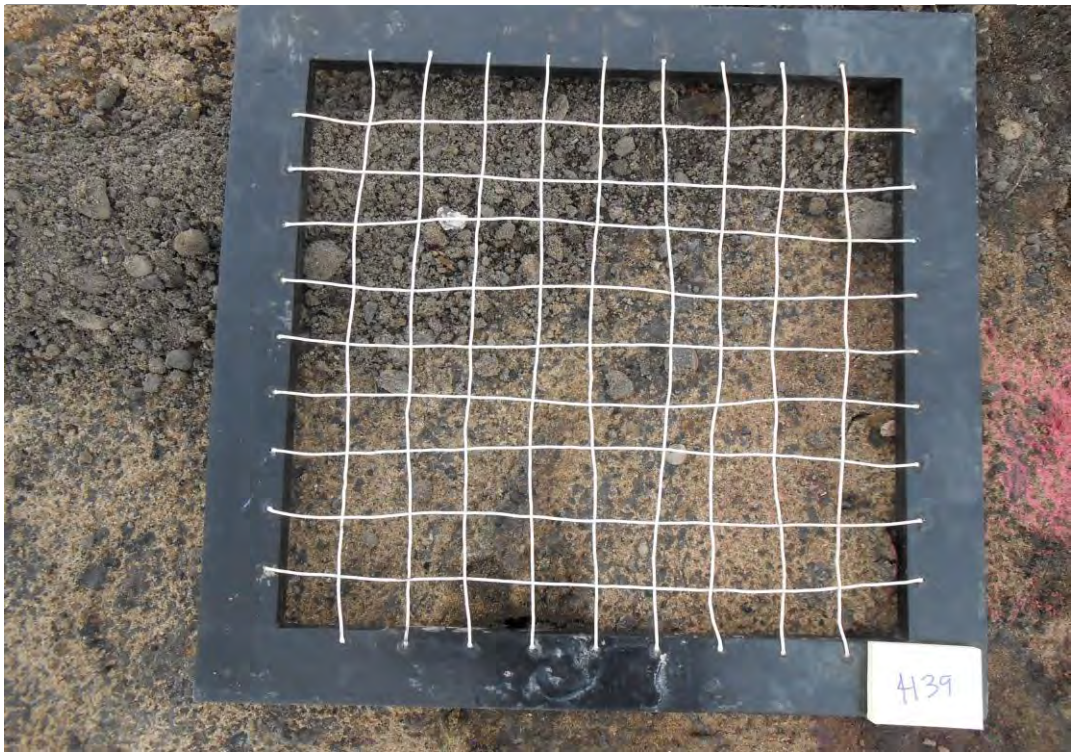
Light gray silty fine sand with trace fine gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4138, 4139

Light brown silty fine sand



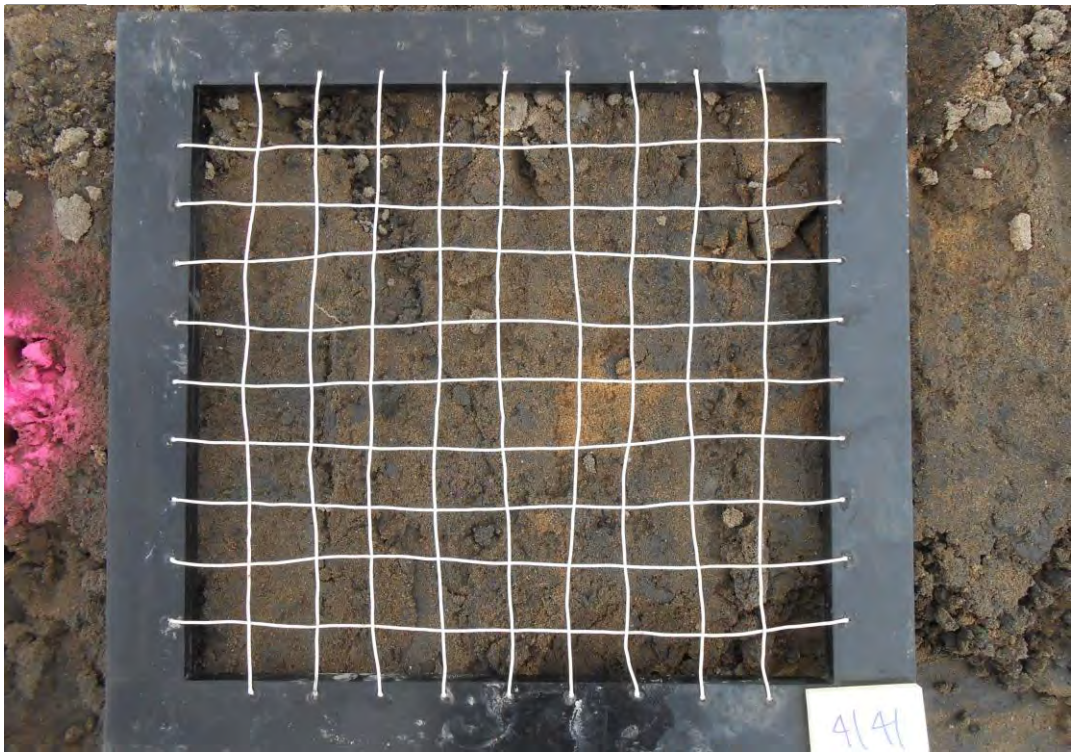
Variegated light gray-brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4140, 4141

Light brown silty fine sand with trace gravel

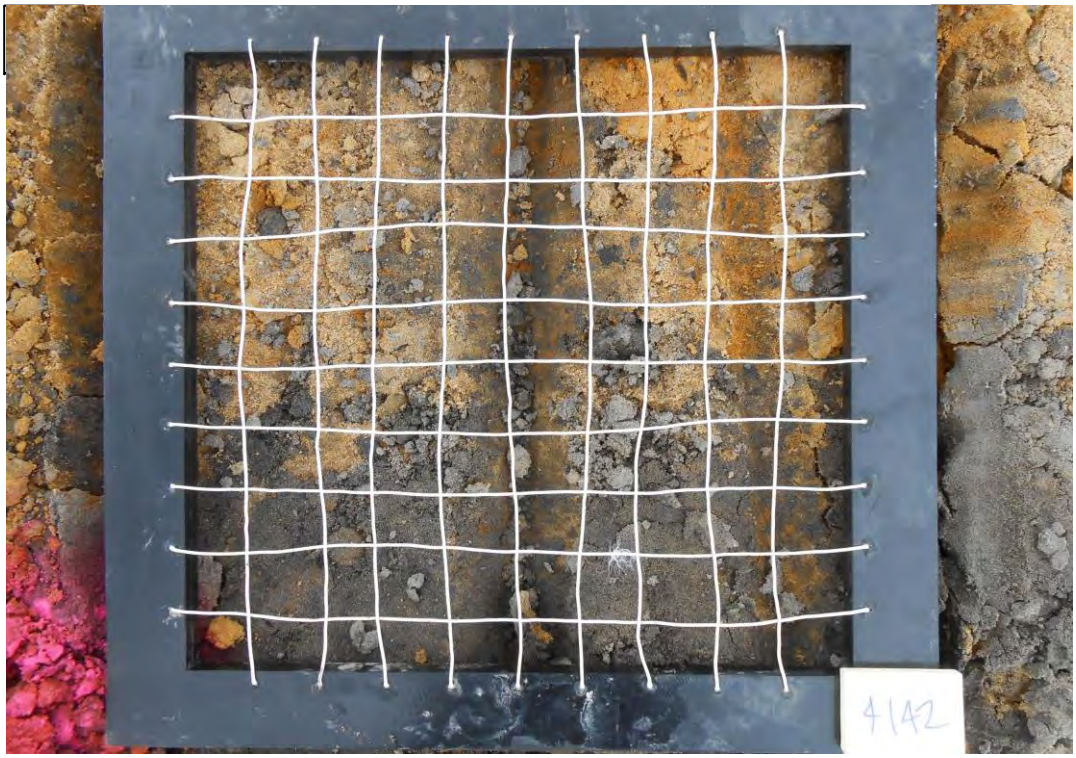


Brown silty fine sand

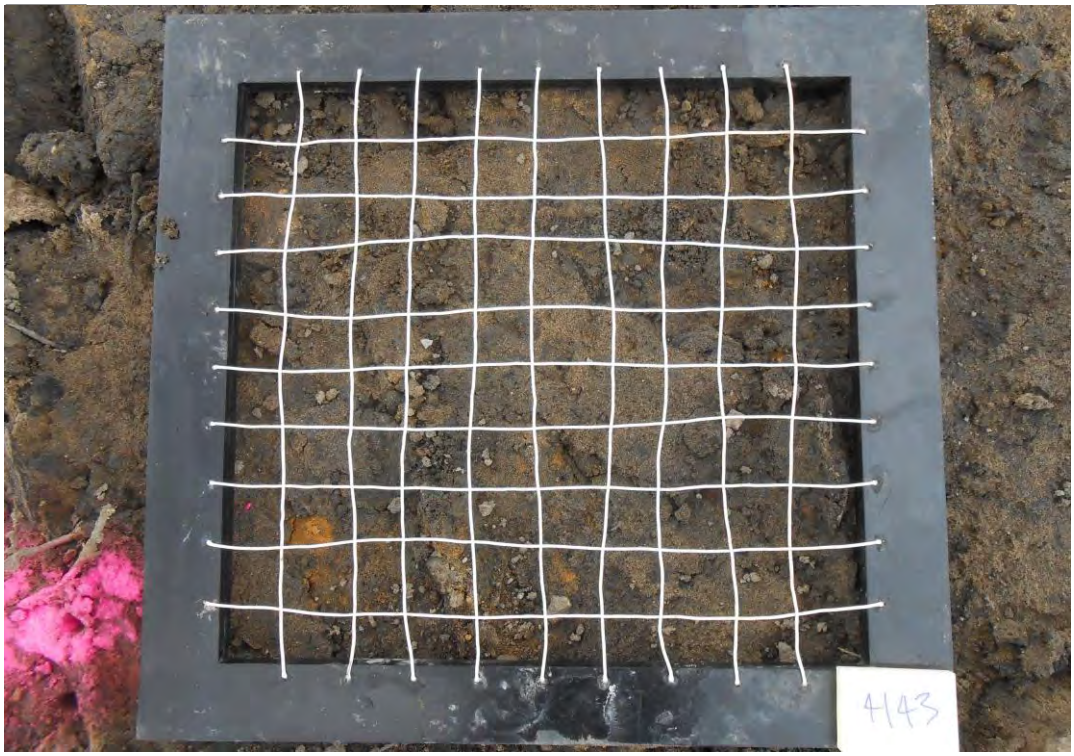
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4142, 4143



Variegated orange-gray silty fine sand

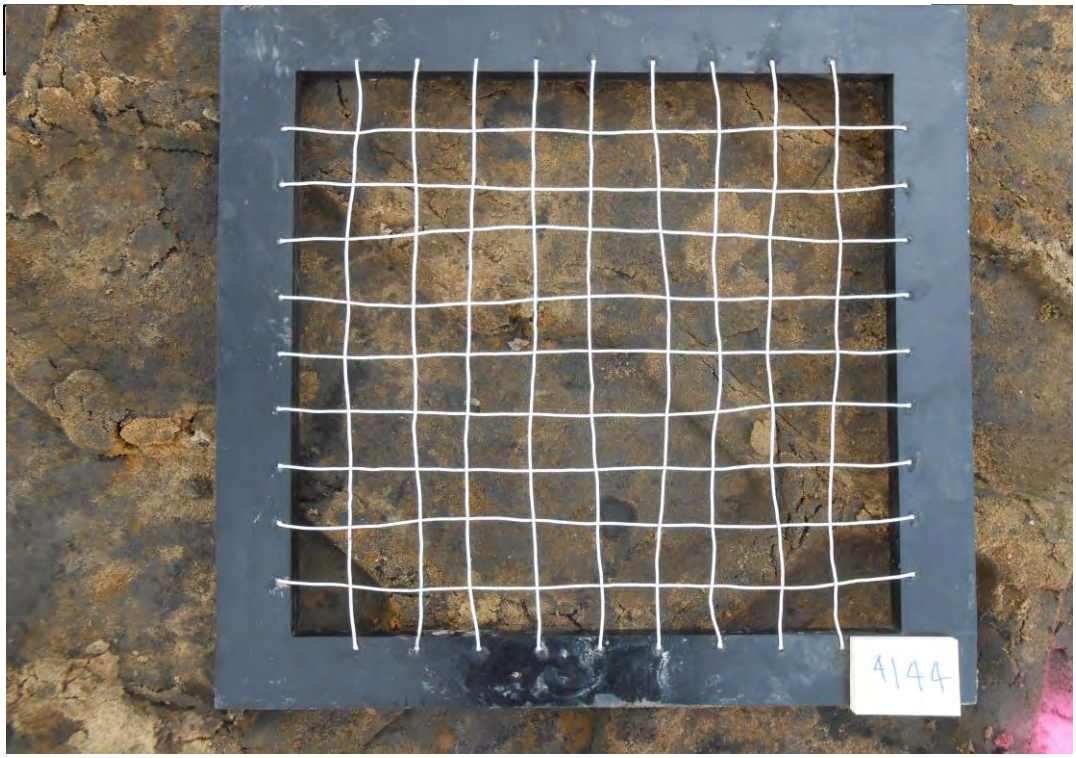


Variegated gray-brown silty fine sand

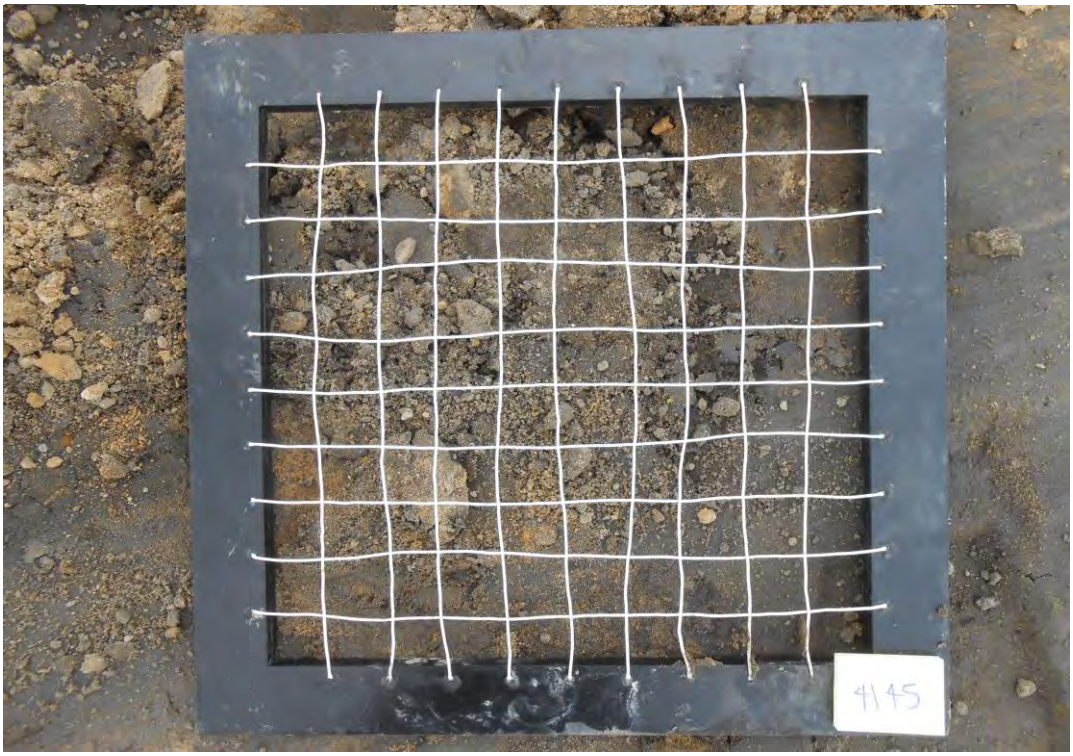
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4144, 4145



Variegated gray-brown silty fine sand

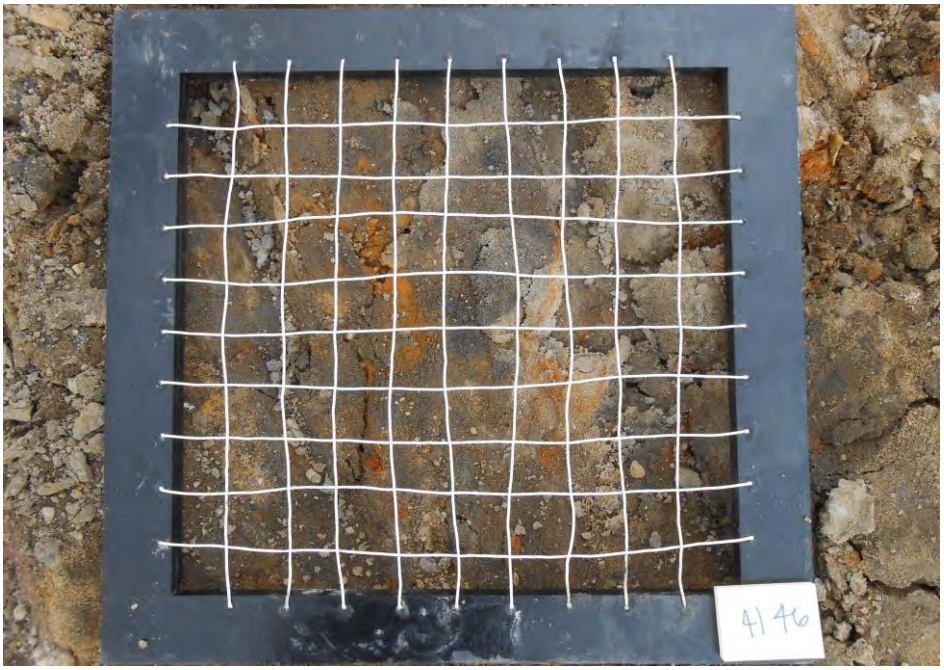


Variegated gray-brown silty fine sand

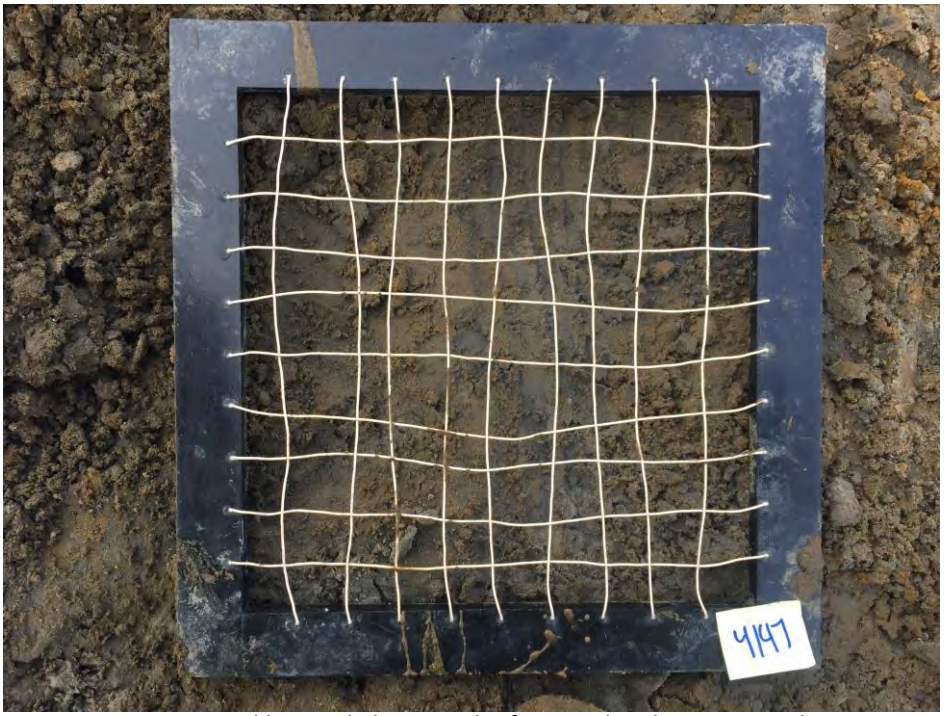
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4146, 4147



Gray silty fine sand with trace gravel



Variegated brown-light gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4148
4149

Variegated light brown-light gray silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4149

Dark gray silty fine sand with trace peat and trace clay

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Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4150

Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4151

Medium gray silty fine sand

Brown silty fine sand with trace gravel

Brown silty fine sand with trace gravel and roots

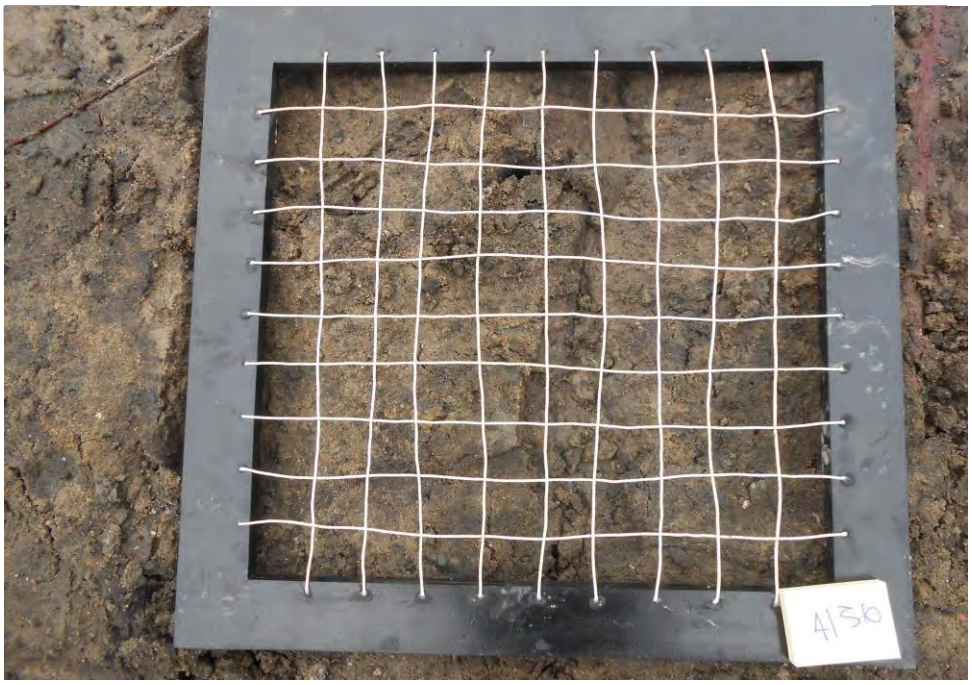
Variegated orange-dark gray silty fine sand with trace gravel and roots

Variegated light-dark brown silty fine sand with trace gravel and roots

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4156
4157



Variegated light-dark brown silty fine sand with trace gravel

Variegated gray-brown silty fine sand with trace gravel and sticks

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4158
4159

Variegated dark-light brown silty fine sand with trace gravel and sticks

Brown silty fine sand

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Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4160, 4161

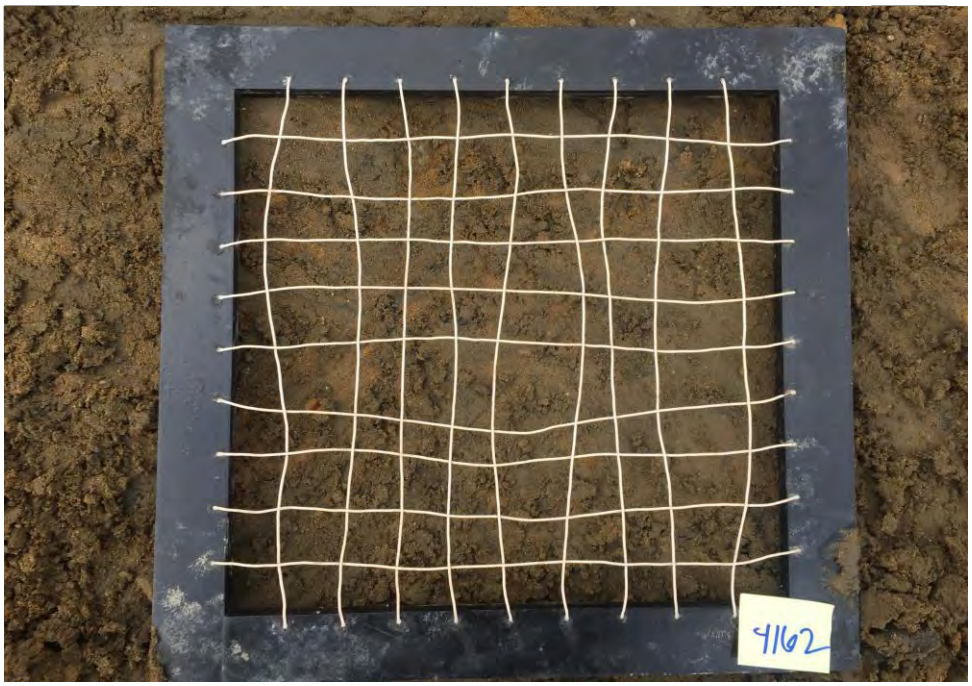
Brown silty fine sand

Variegated light brown-dark gray silty fine sand with trace roots

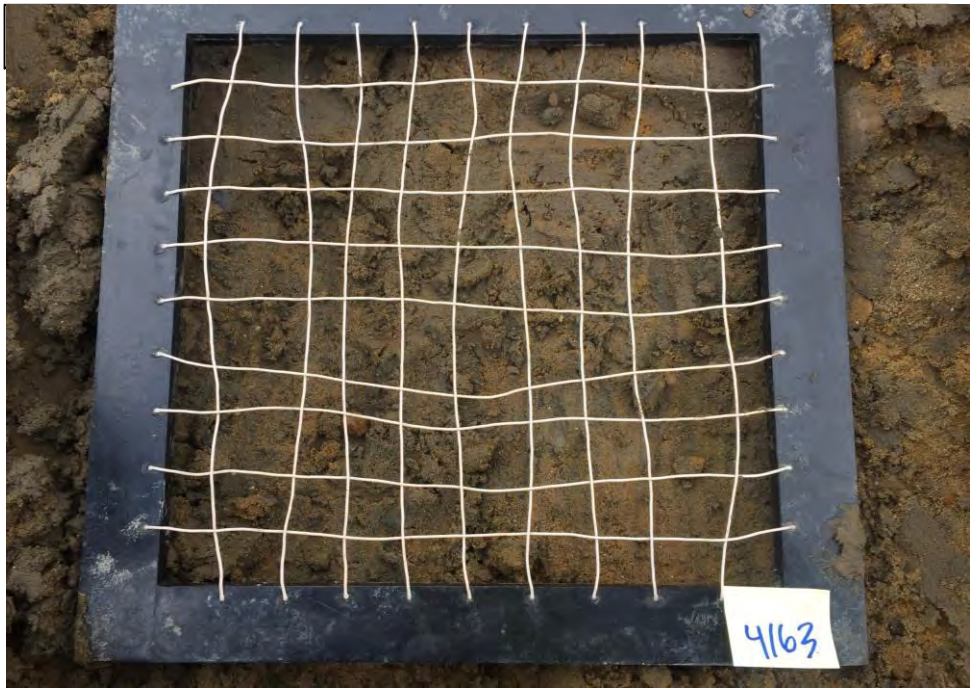
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4162
4163



Variegated light brown-dark gray silty fine sand with trace roots



Brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4164

Brown silty fine sand with trace clay

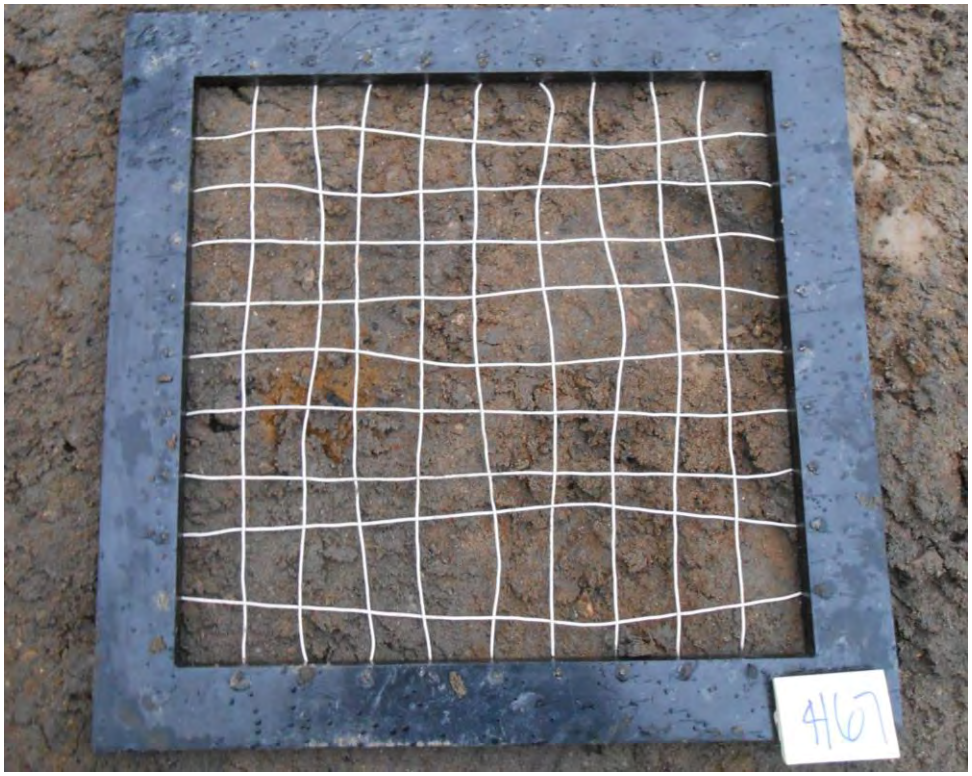
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4165

Brown-orange silty fine sand with trace clay and trace gravel

Variegated gray-brown silty fine sand with trace gravel



Variegated gray-brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4168

Light brown silty fine sand

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Documentiaton Pictures

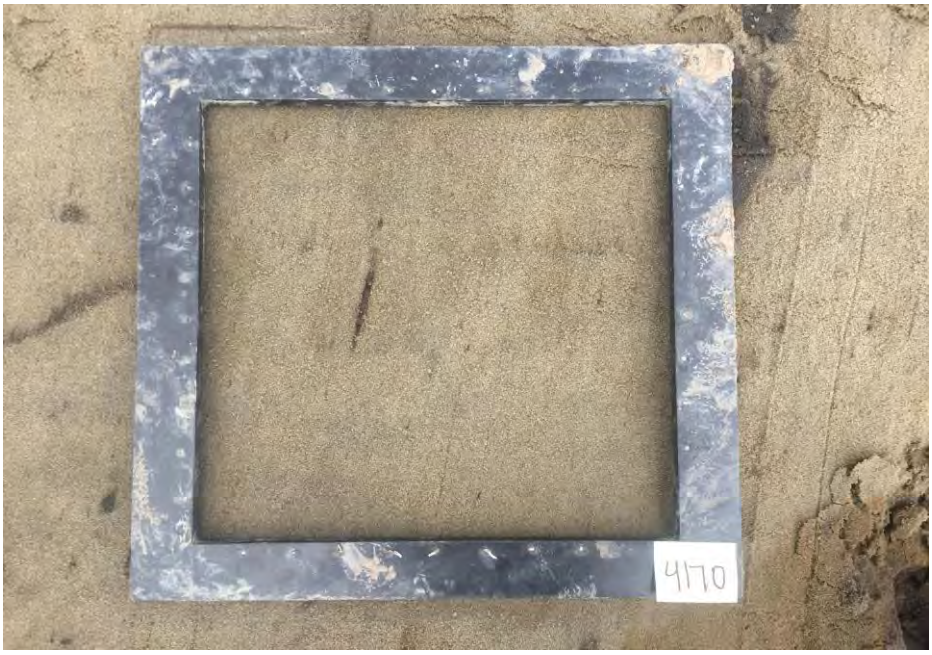
Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4169

Light brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4170



Light brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4171

Brown silty fine sand with trace gravel and shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4172

Brown silty fine sand with trace gravel and shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4173

Dark brown silty fine sand with trace shells

Brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4175

Dark brown silty fine sand

Medium-dark brown silty fine snad with trace shells and sticks

Dark brown silty fine sand

Medium brown sandy silty with some gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4179

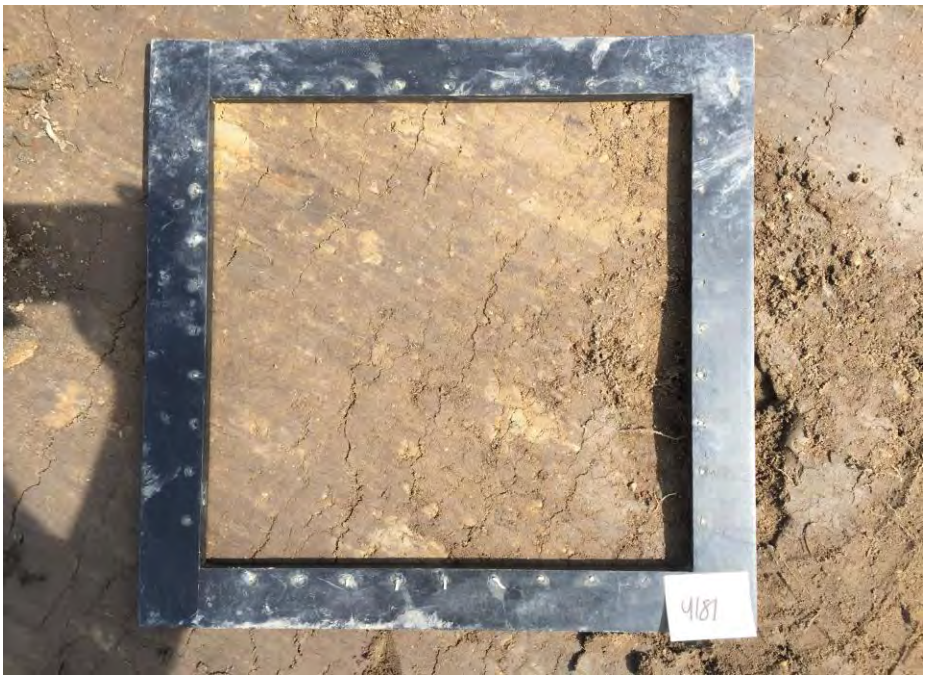
Medium brown sandy silty with some gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: Holland BPW Impoundment System Closure Project No: 133-17-001 Points: 4180

Medium brown sandy silty with some gravel



Dark brown sandy silt

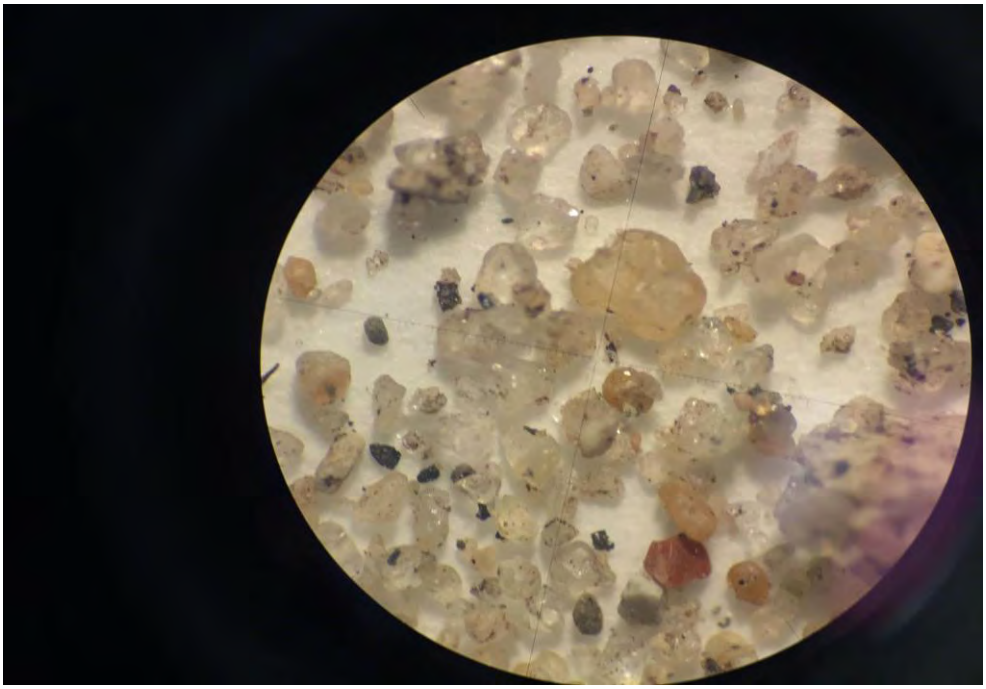
APPENDIX B.1.1

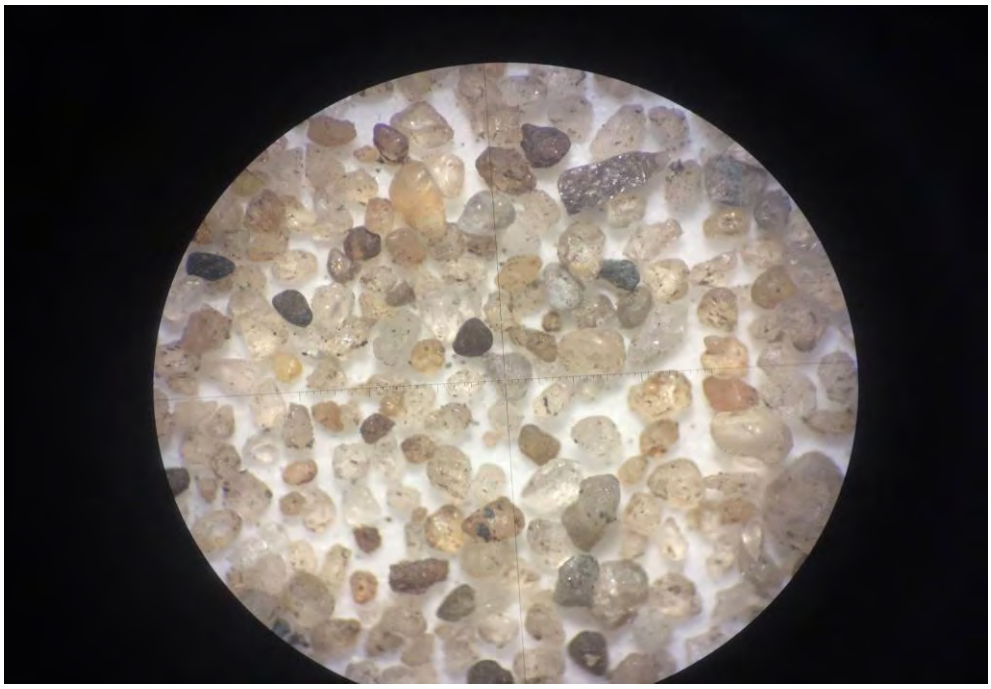
MICROSCOPE EVALUATION

Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4005 / 4015

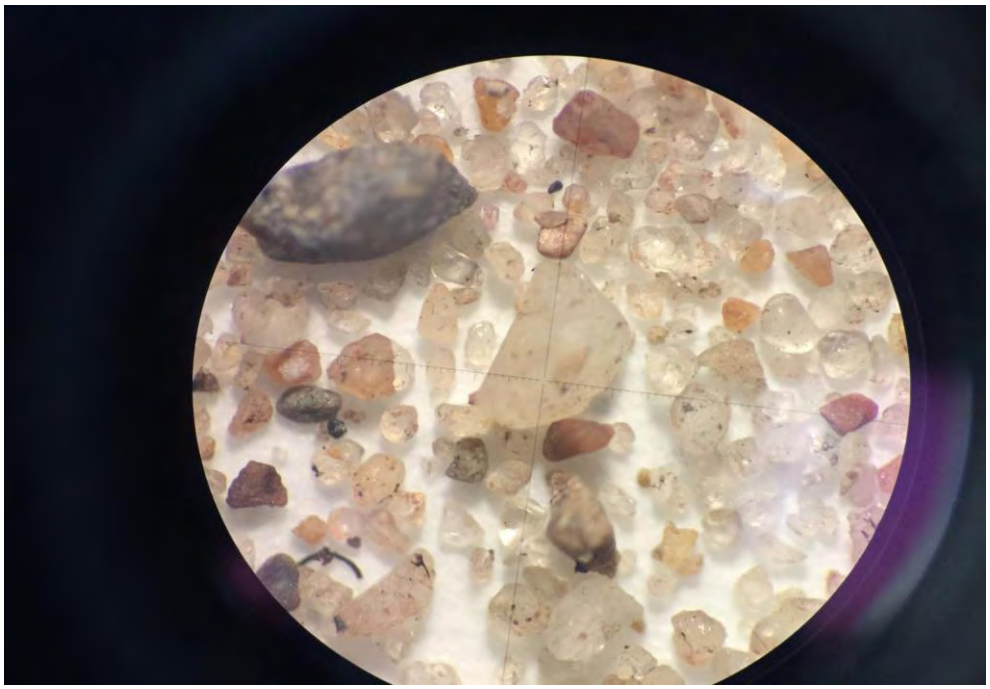


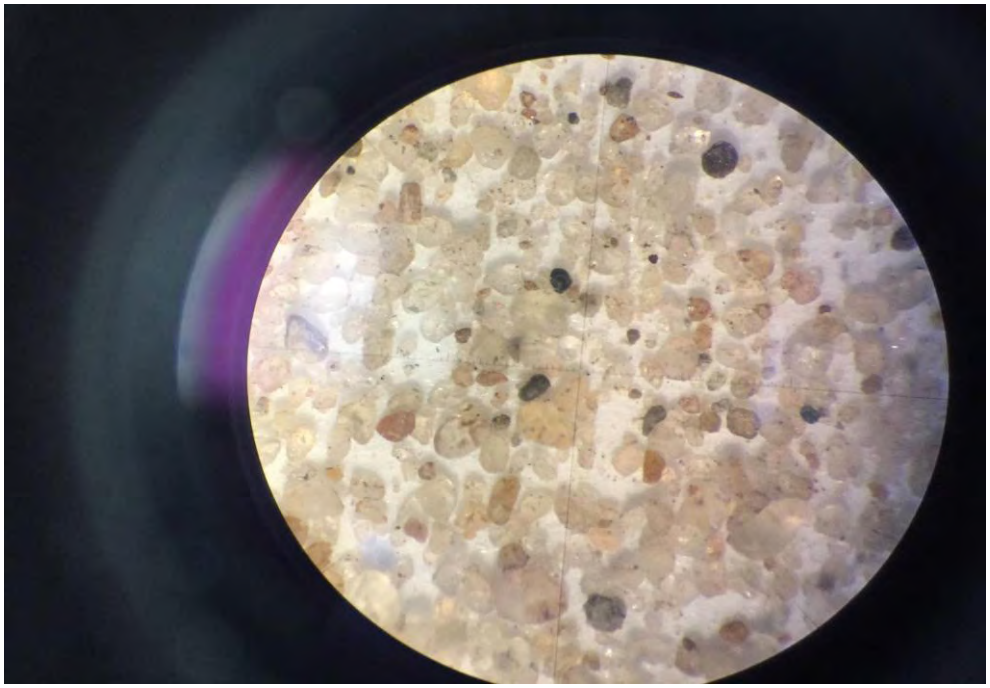


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4020, 4021

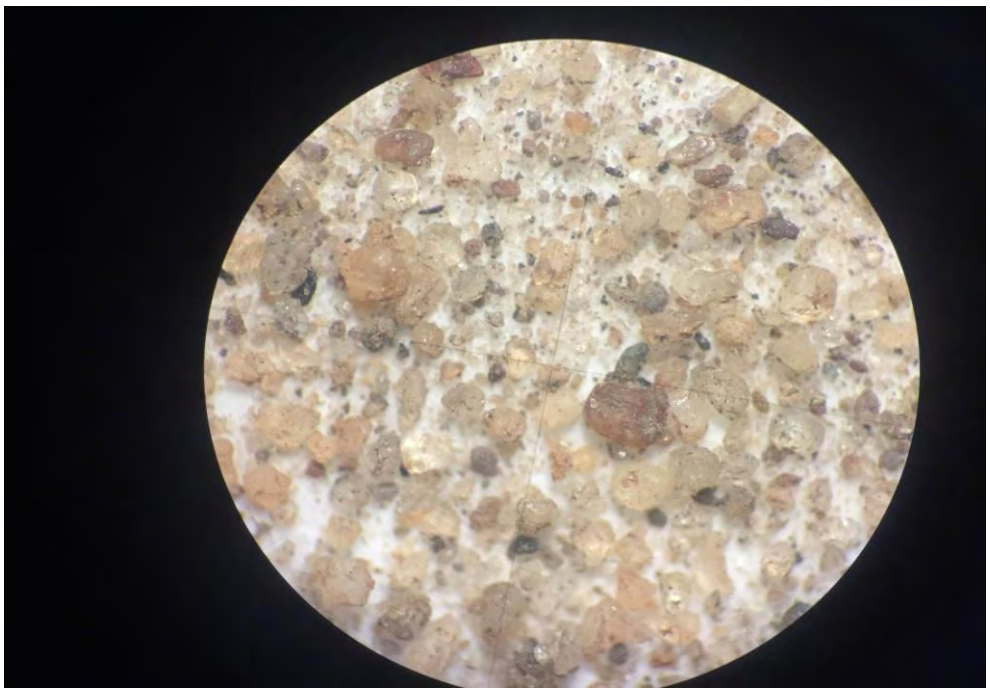


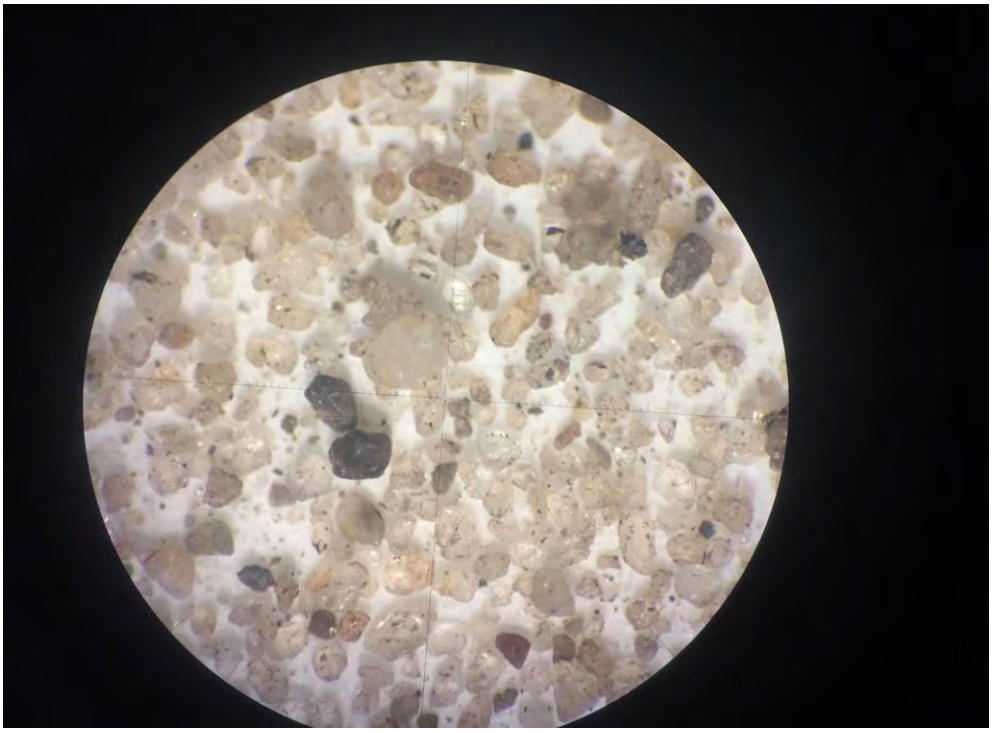


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4023, 4024

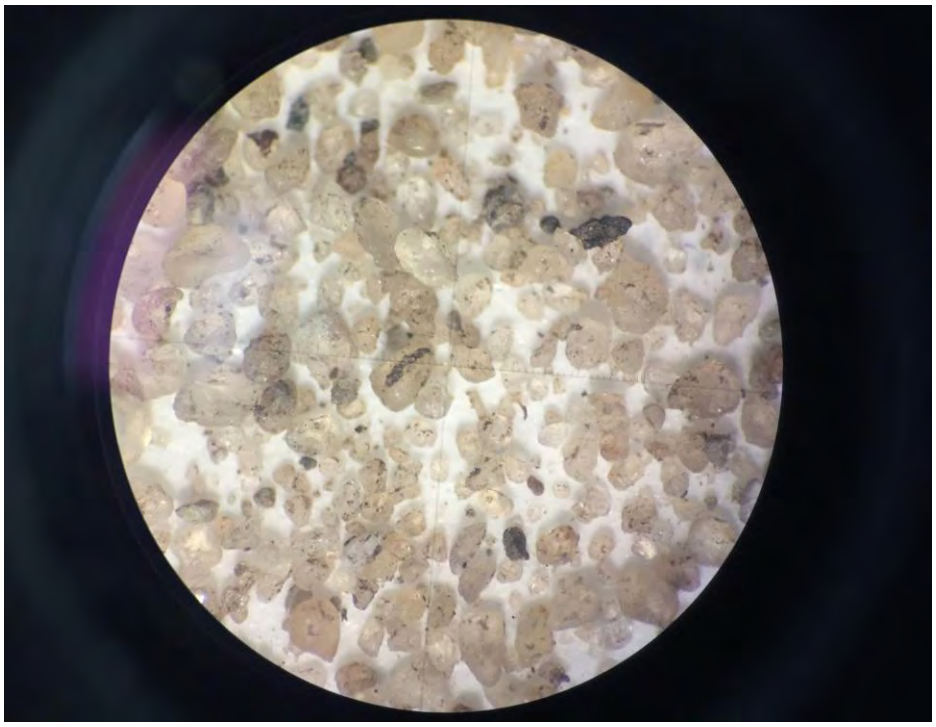


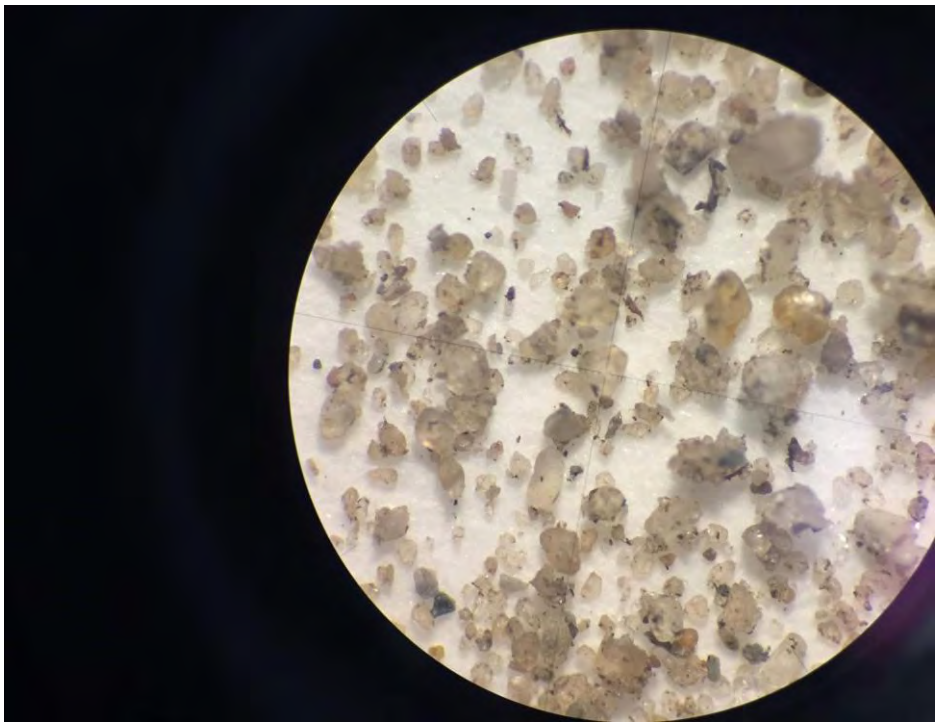


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4031 / 4040



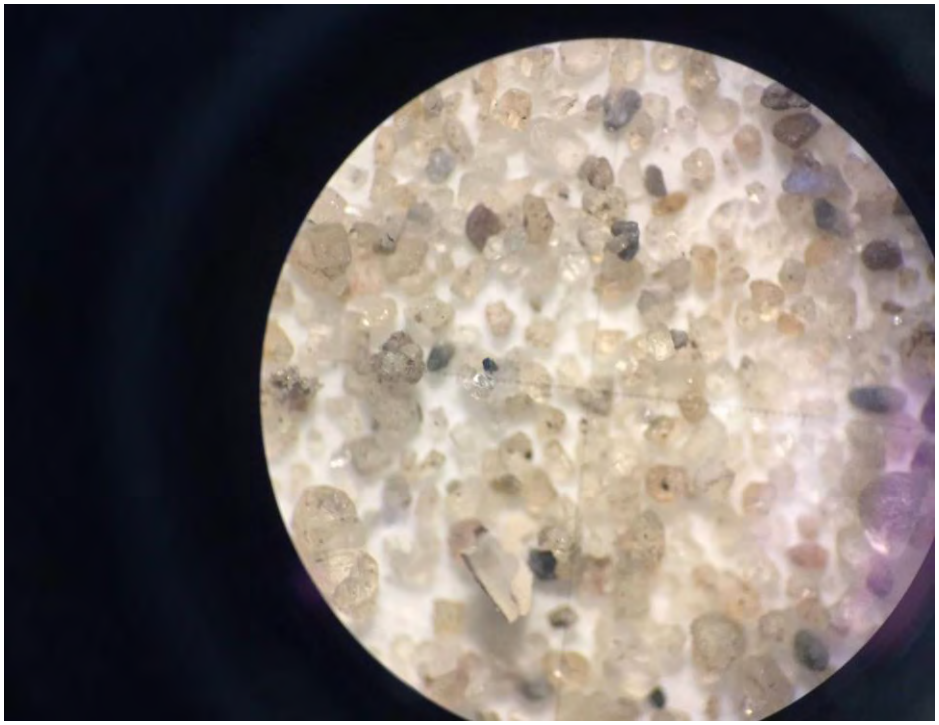


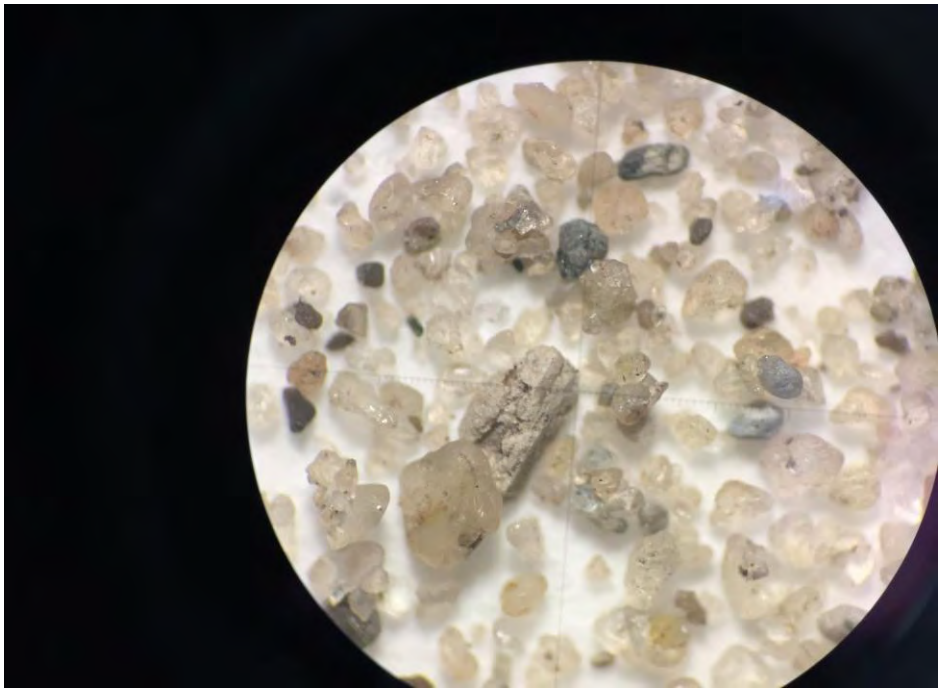
Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4041

4042

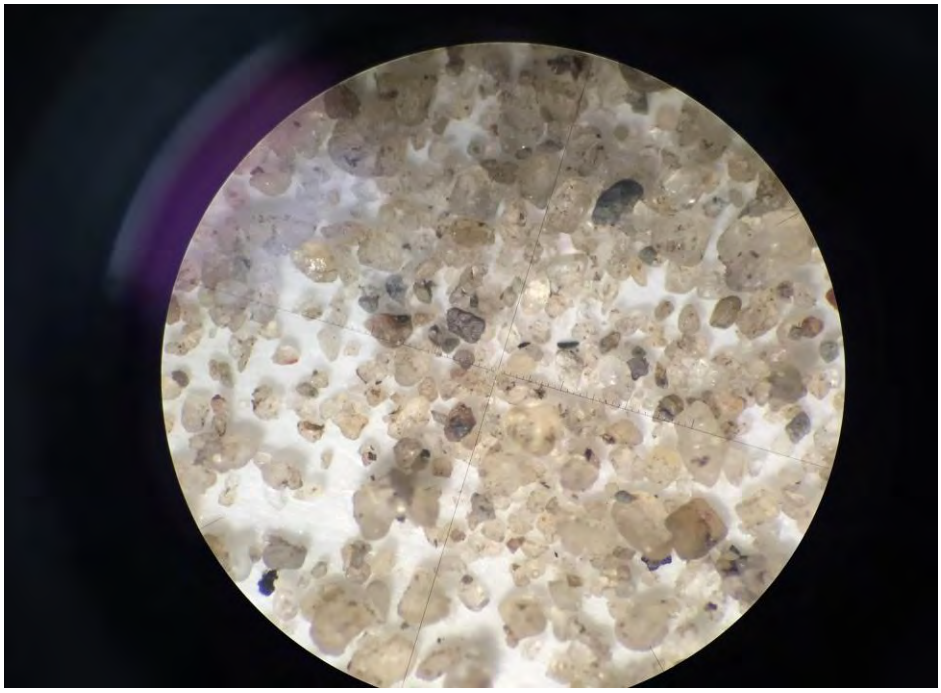


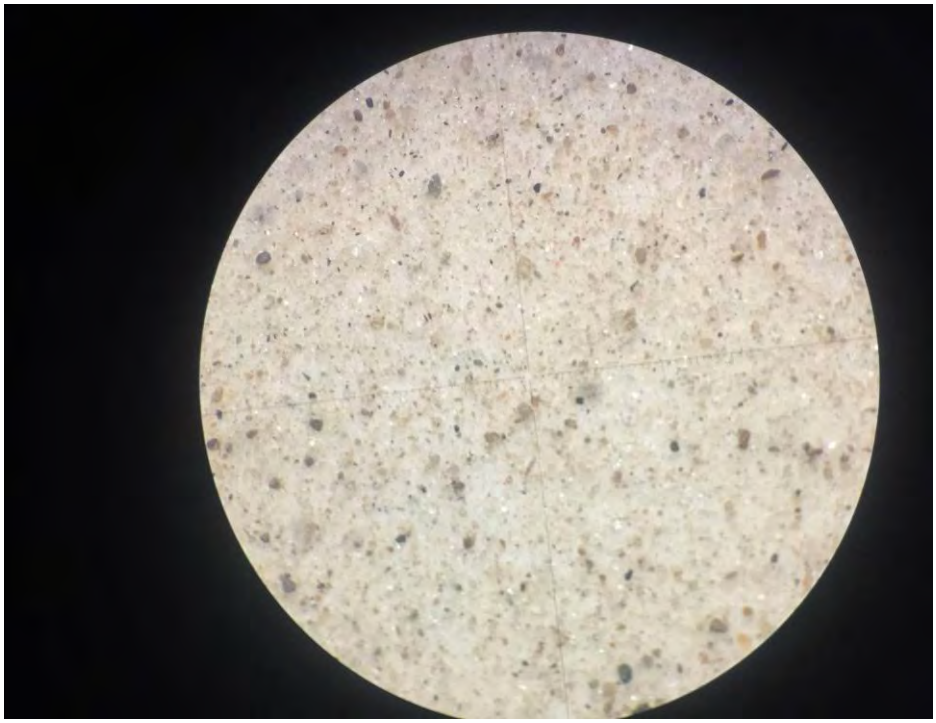


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4043, 4044

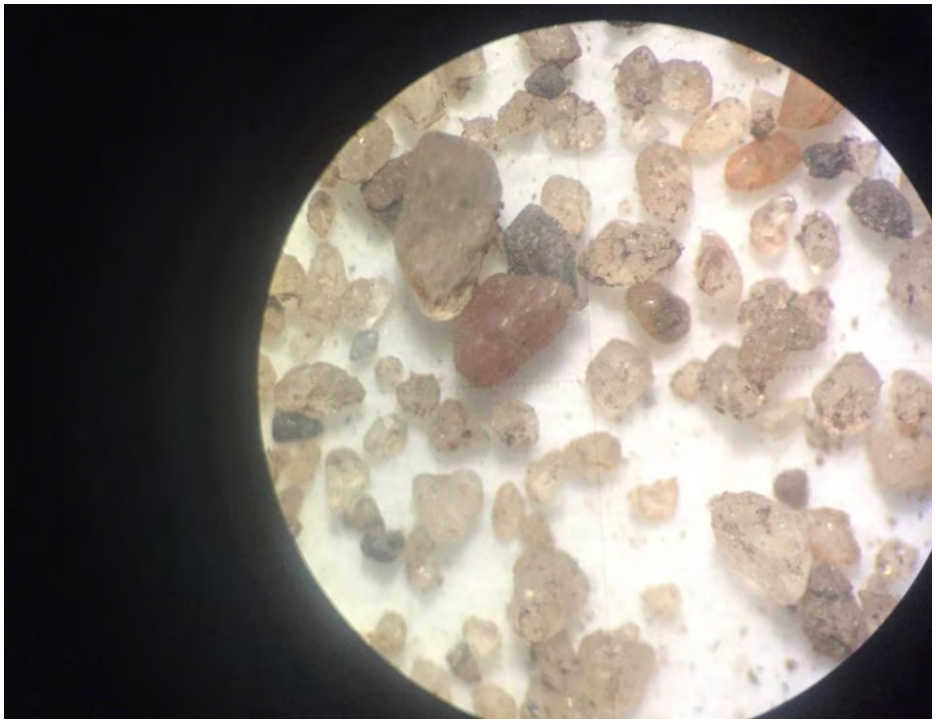


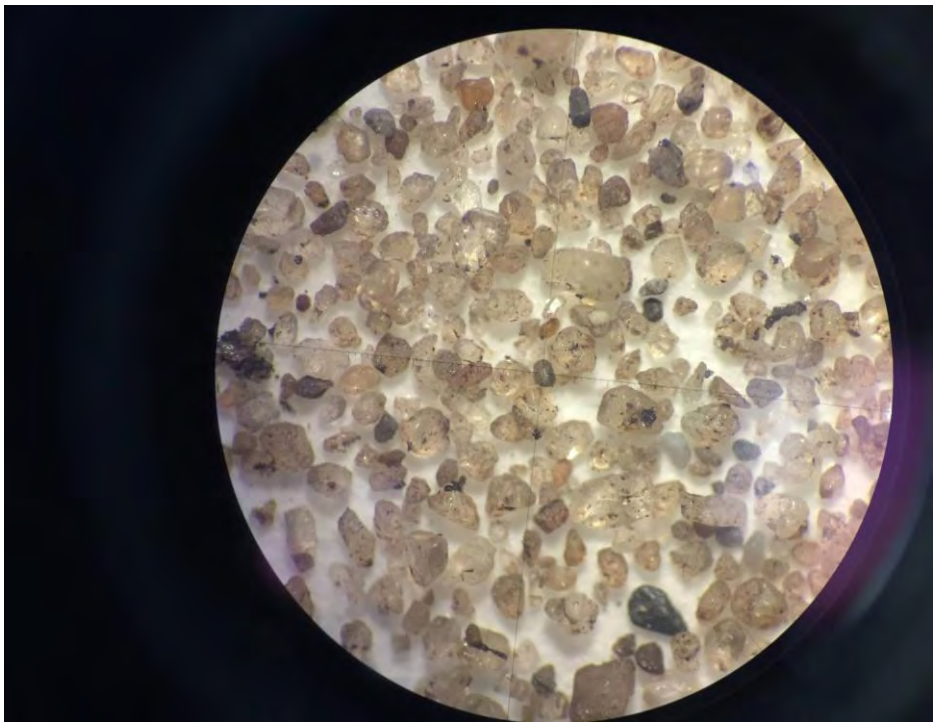


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4045, 4051

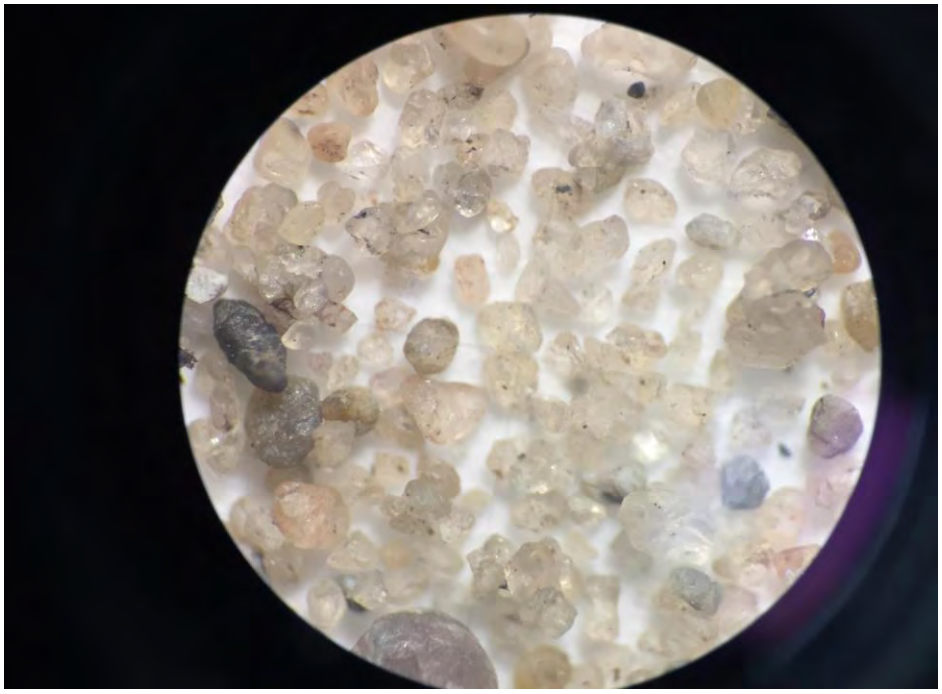


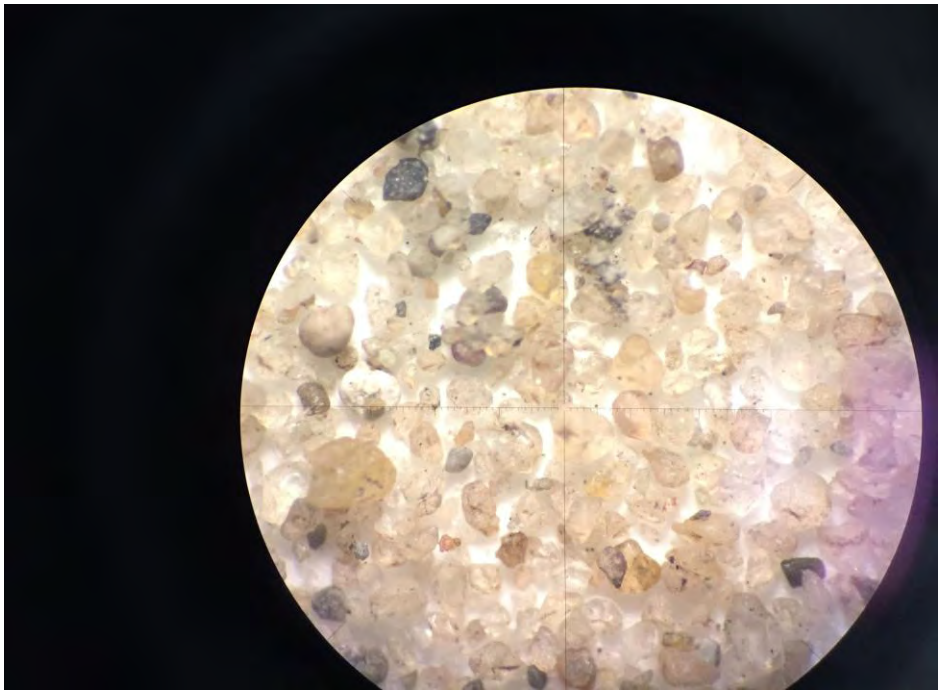


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4054, 4056

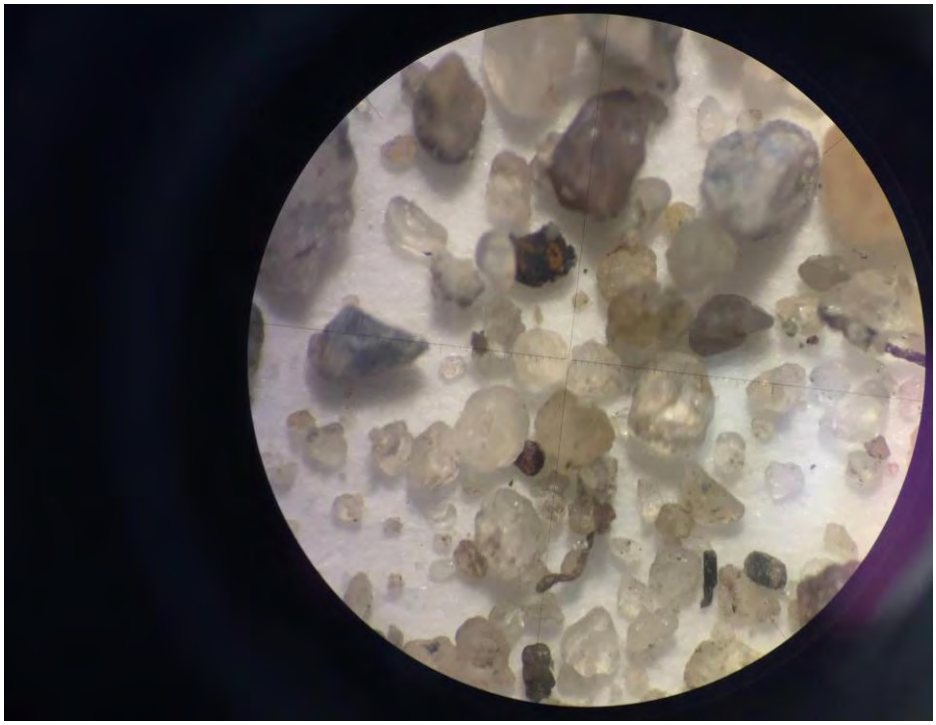


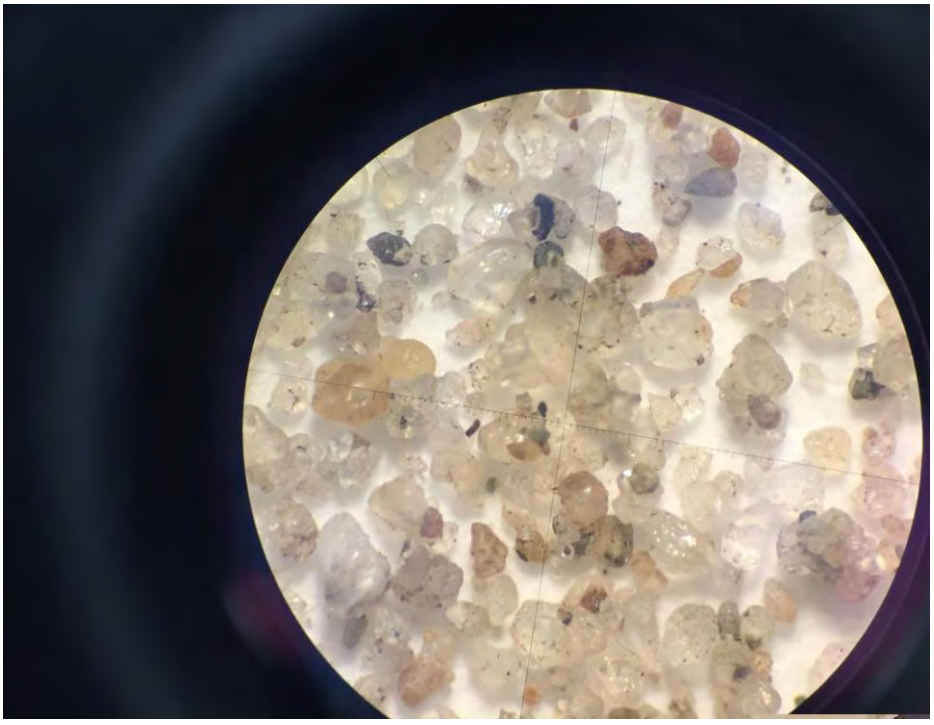


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4064 / 4080

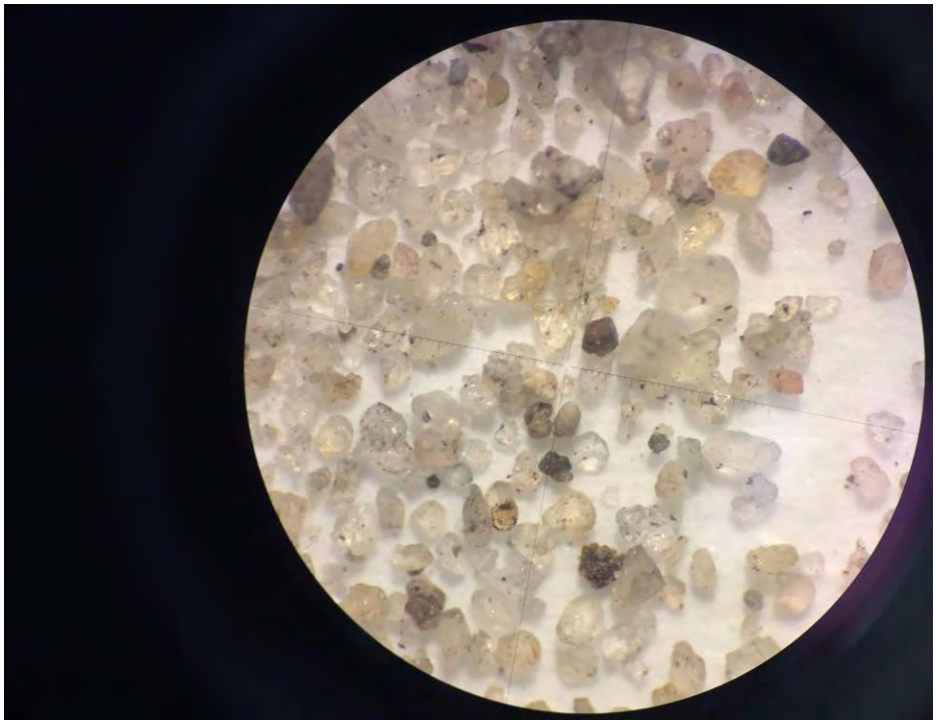


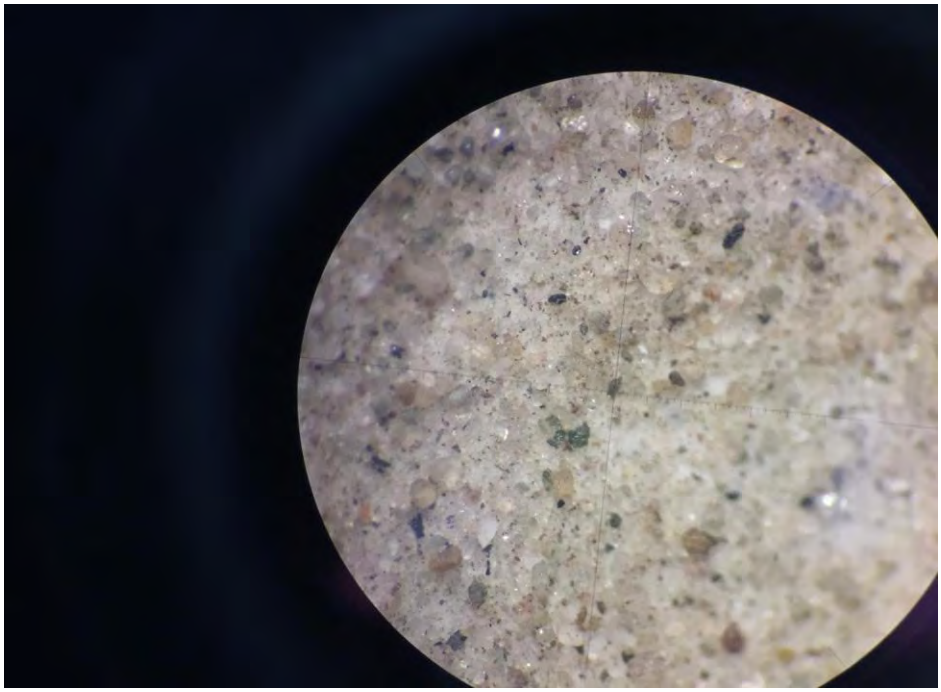


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4081, 4082

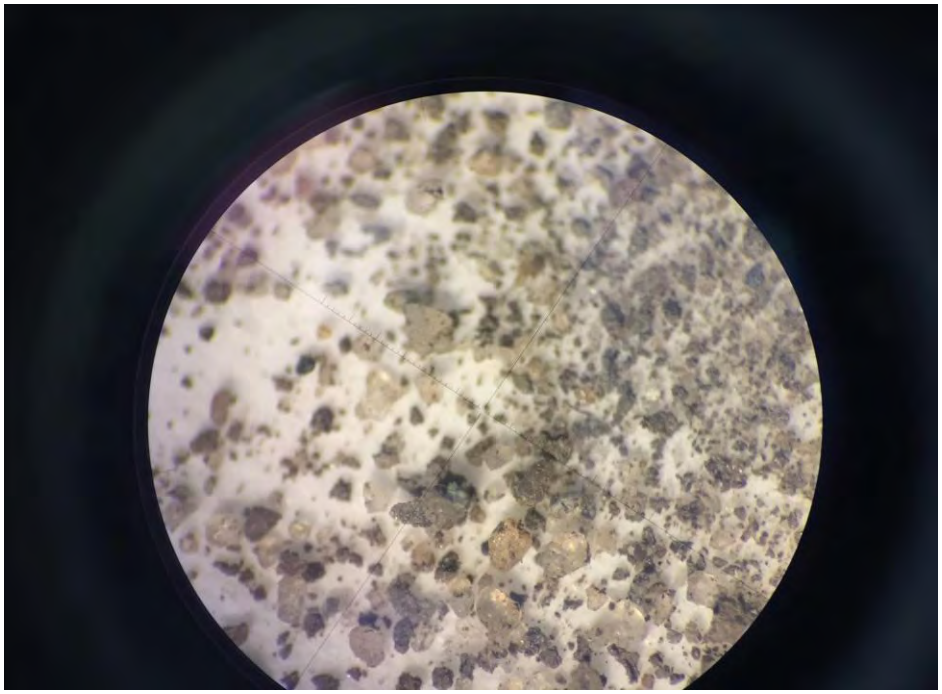


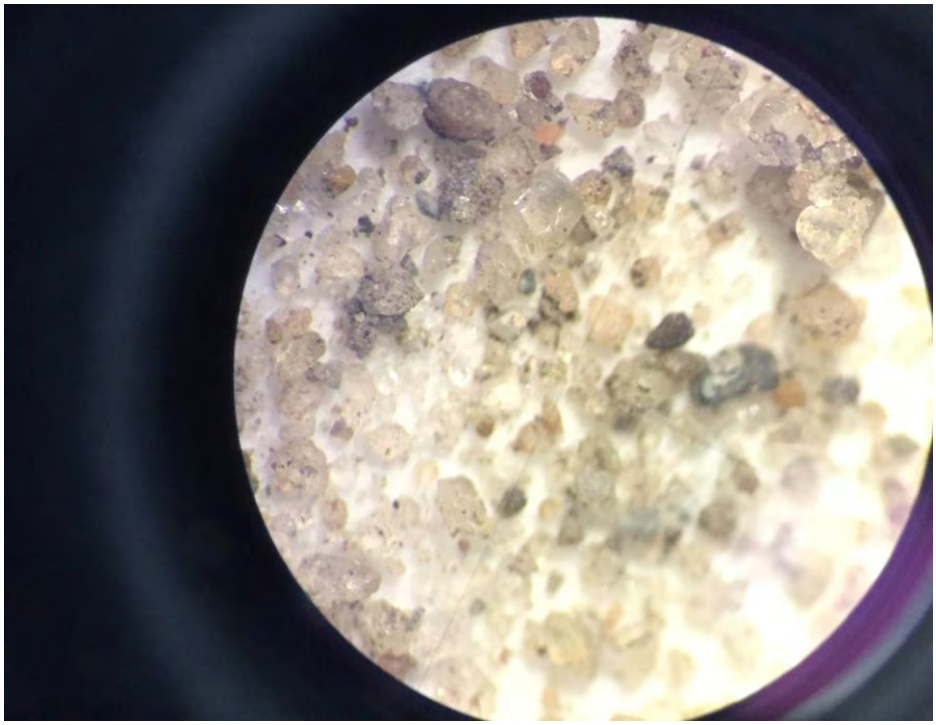


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4083, 4085

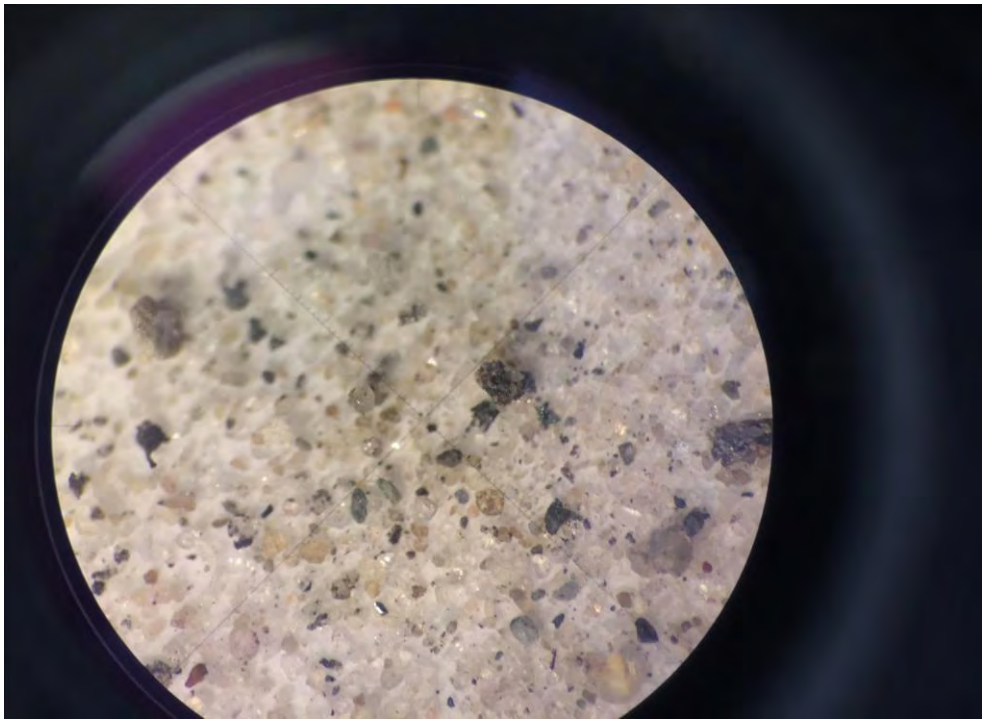


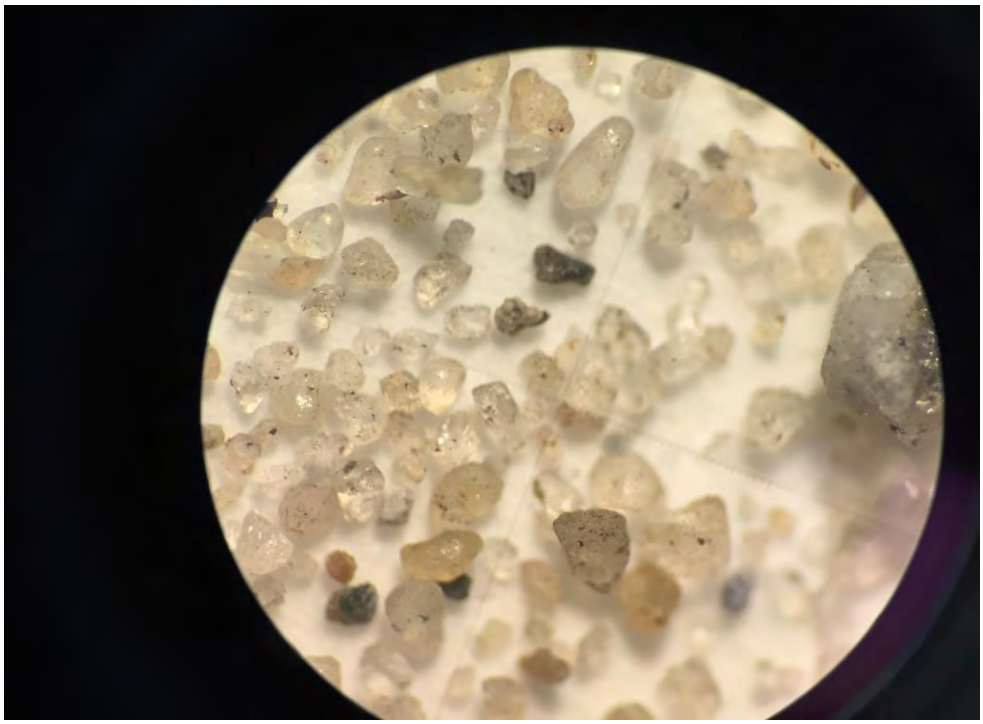


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4087, 4088

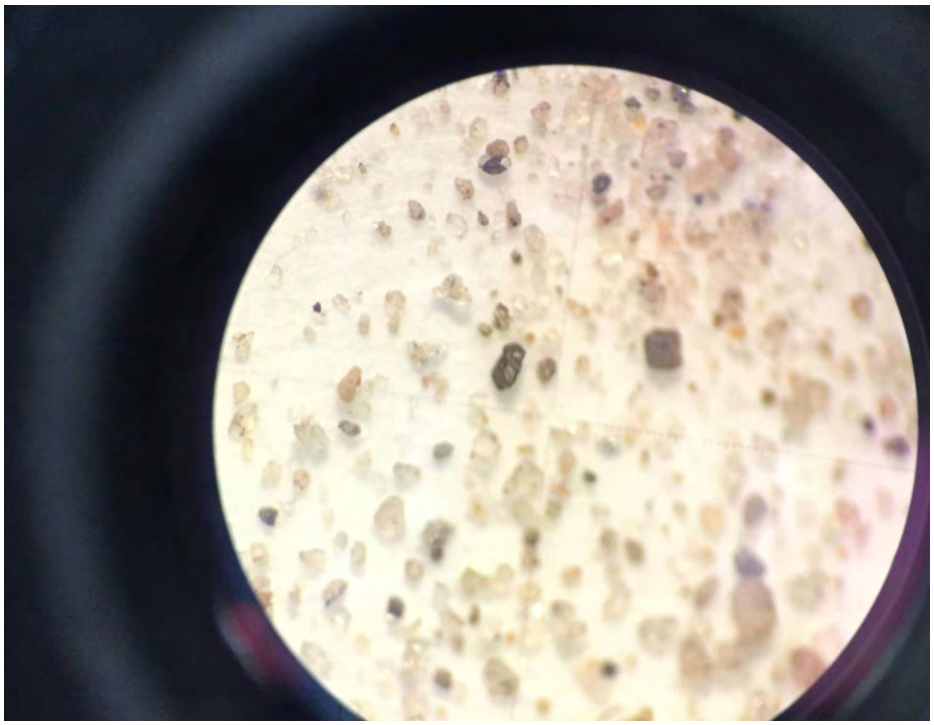


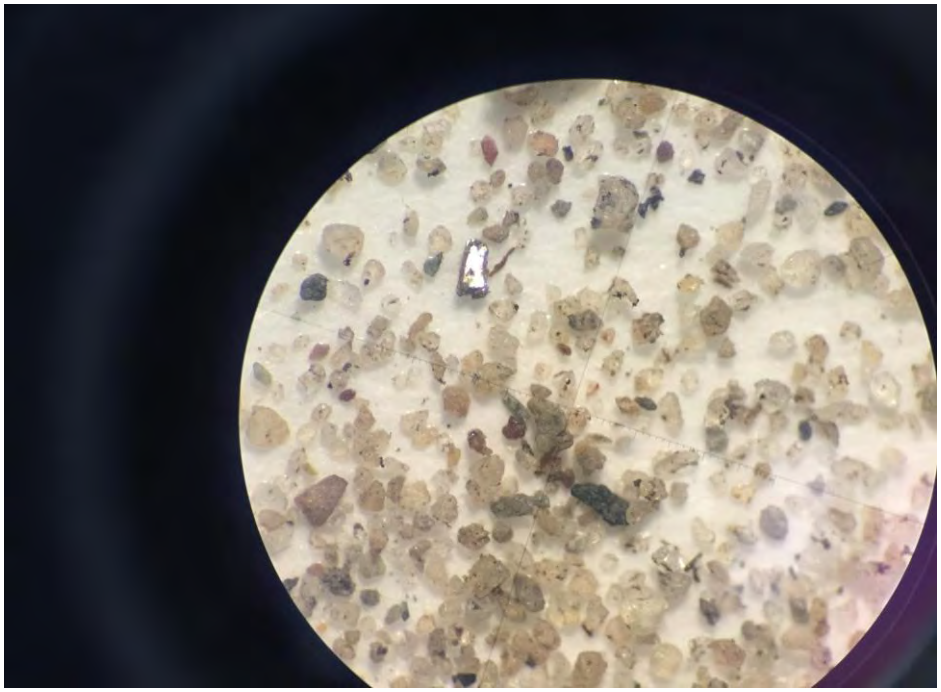


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4091, 4095

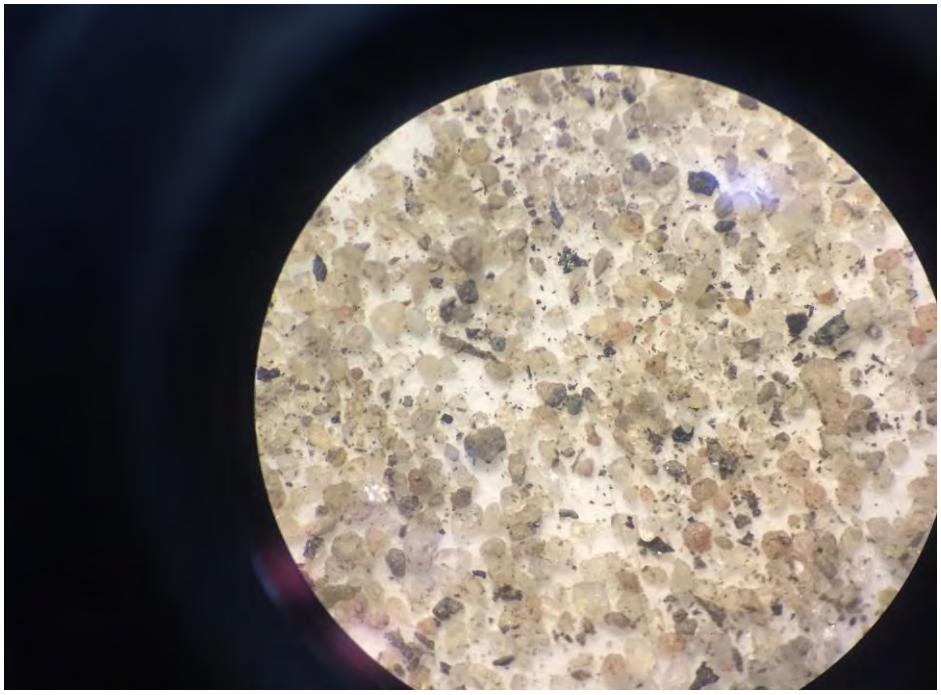


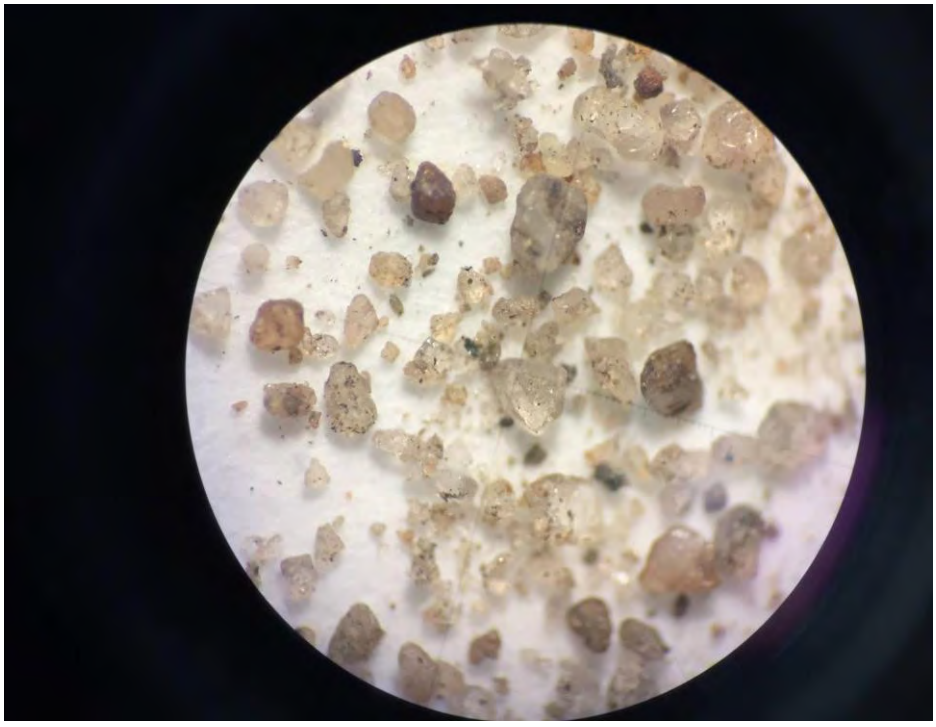


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4098, 4101

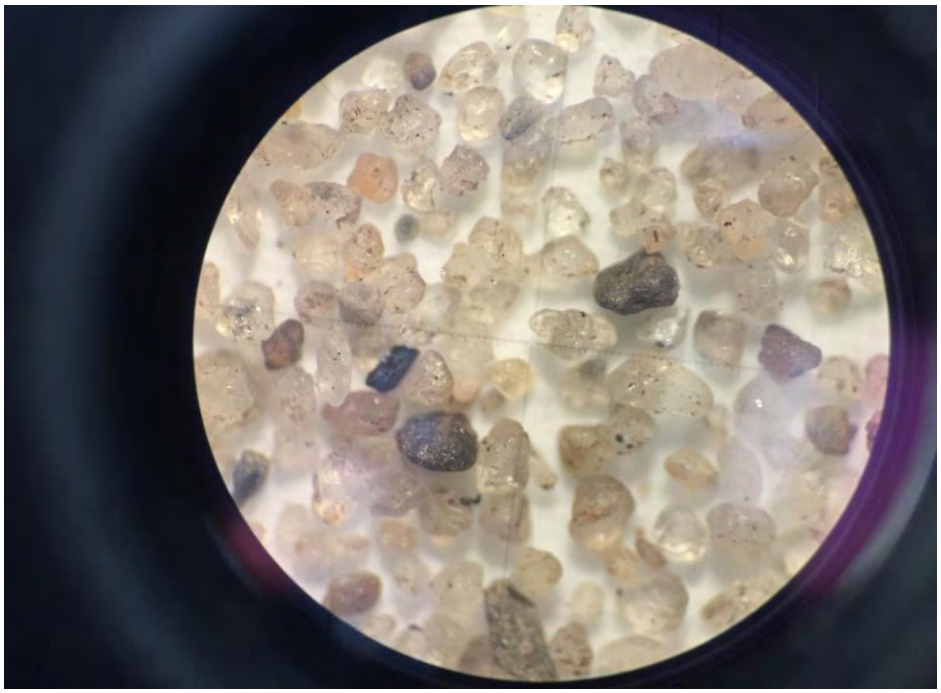


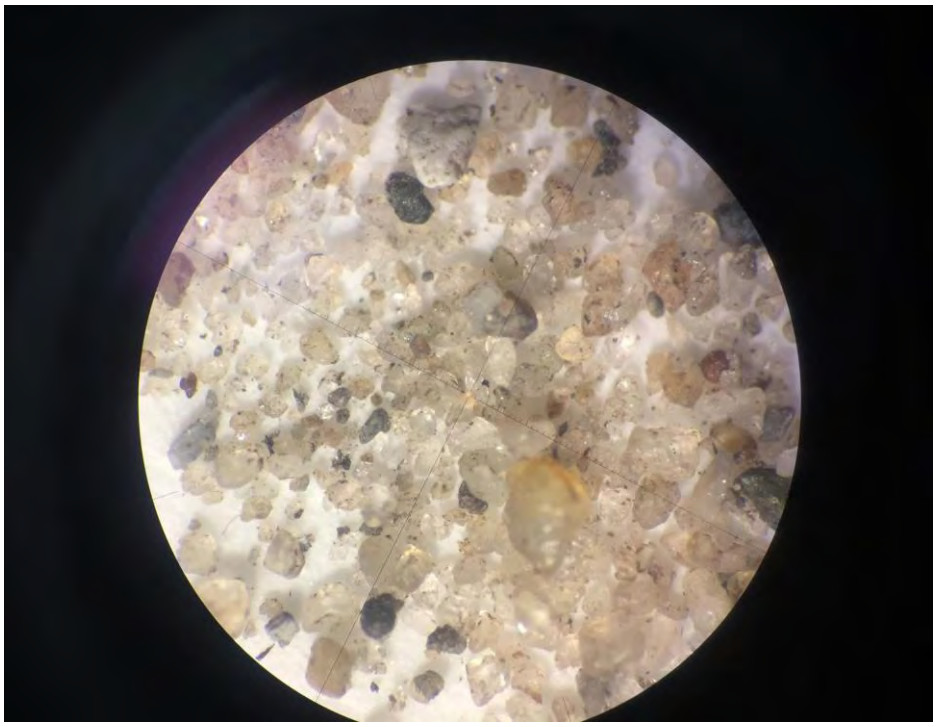


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4105, 4149

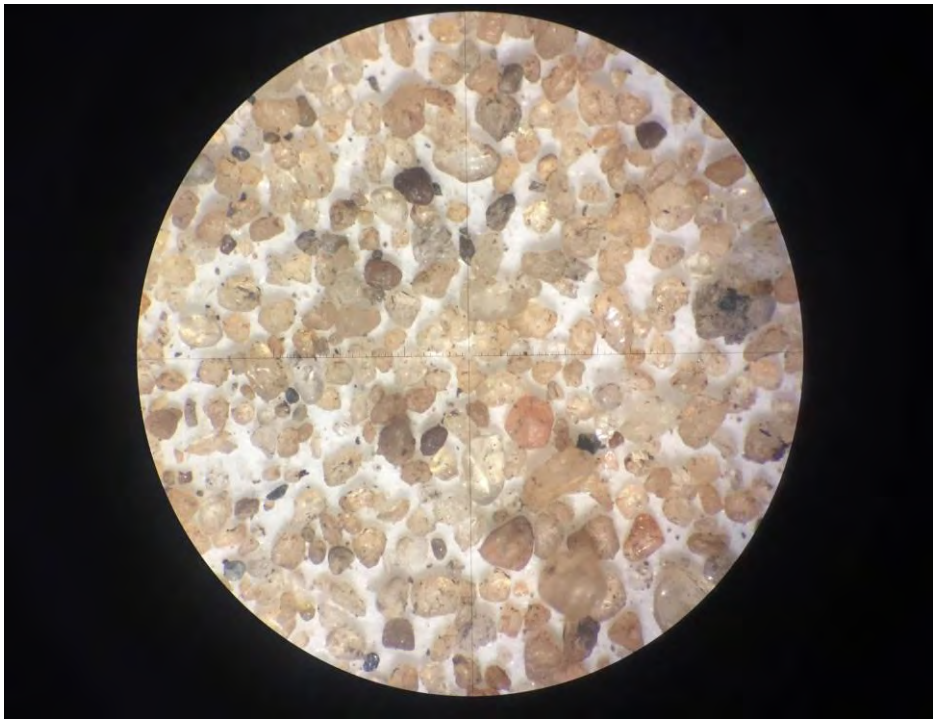


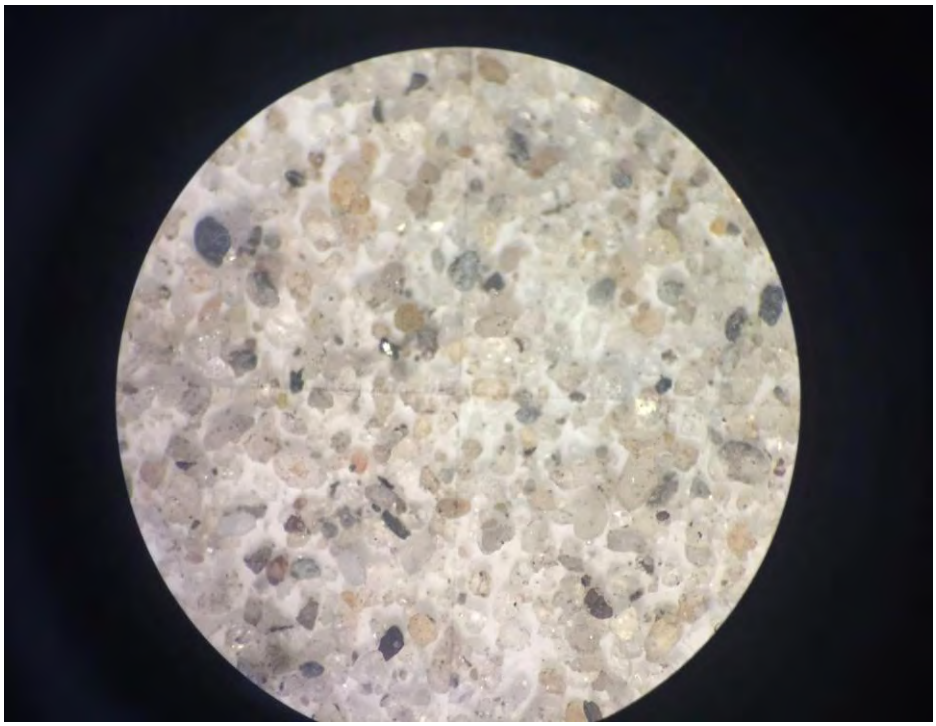


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4168, 4173

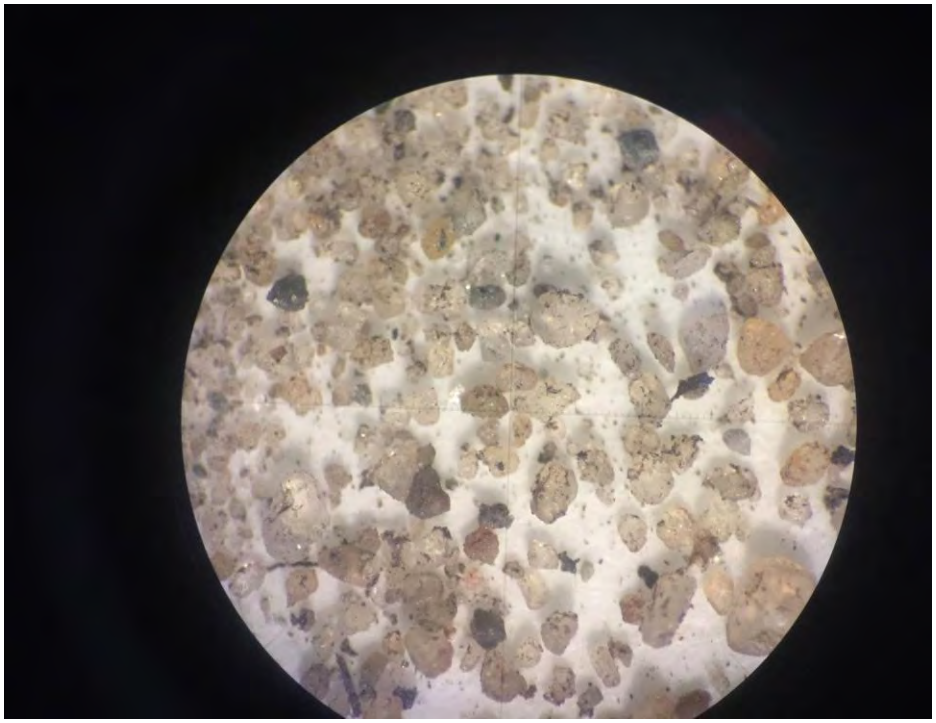


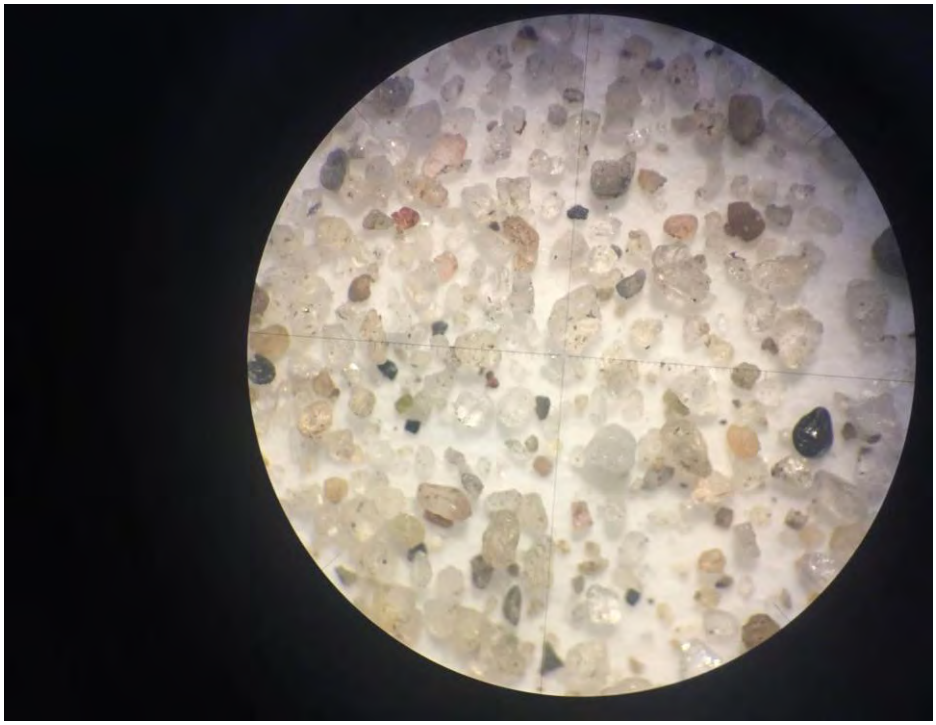


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4174, 4176

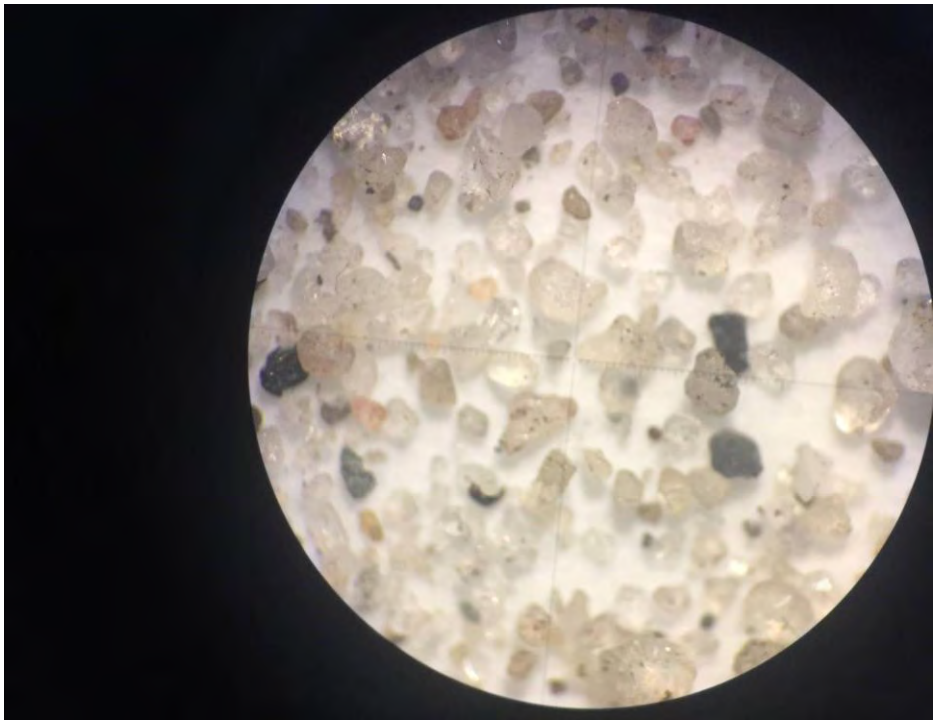


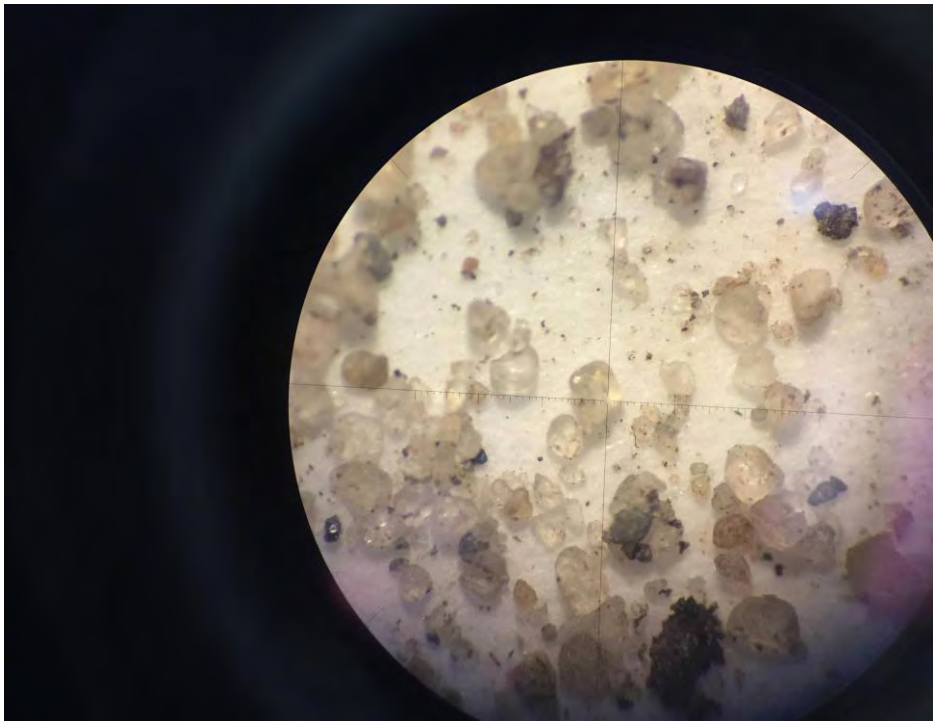


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: 4177, 4181



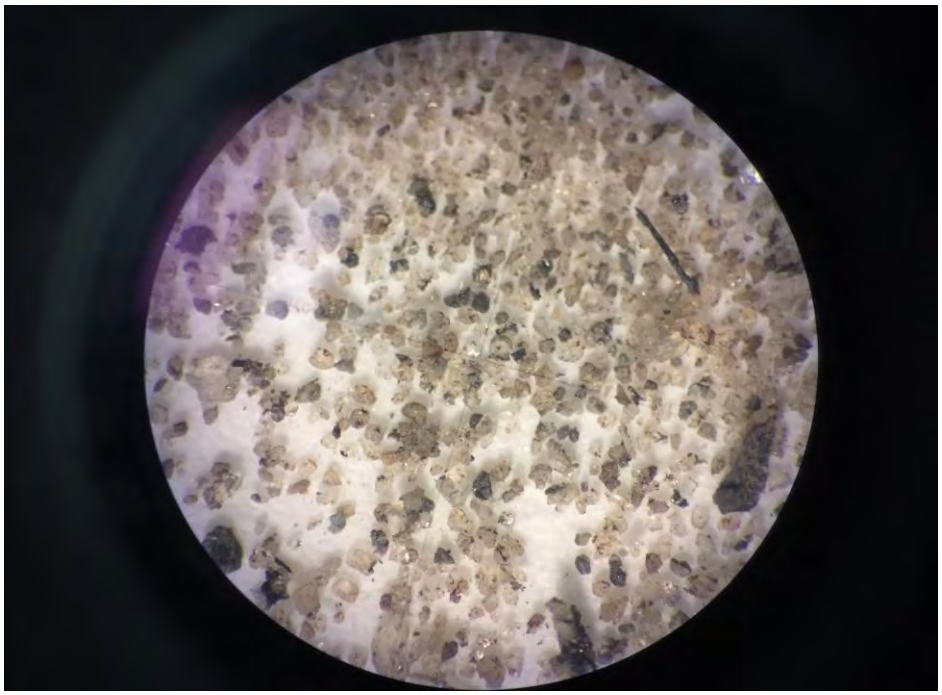


Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: Pond 1

1-1

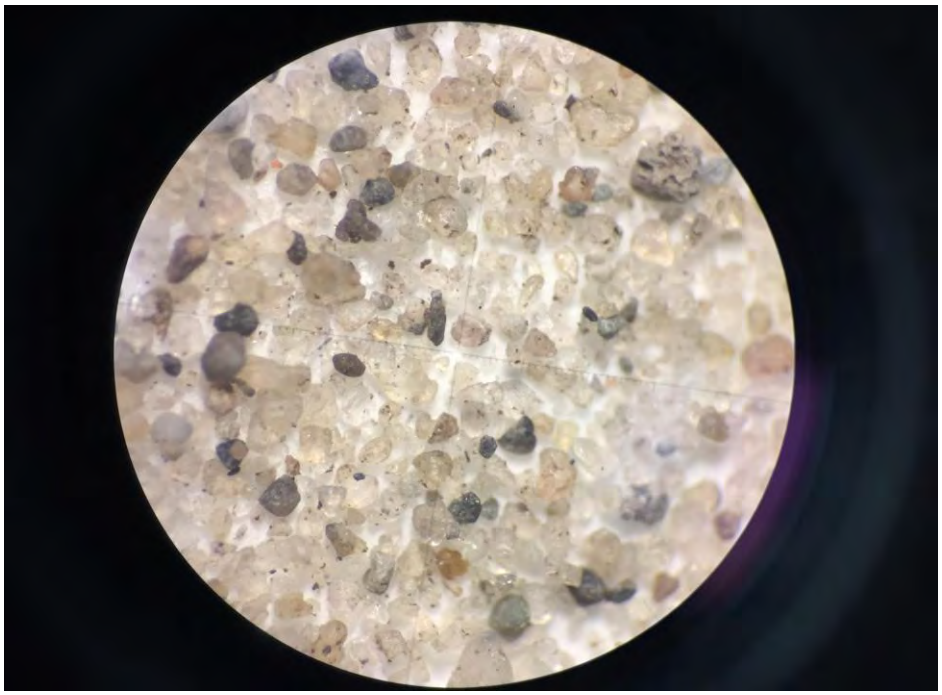


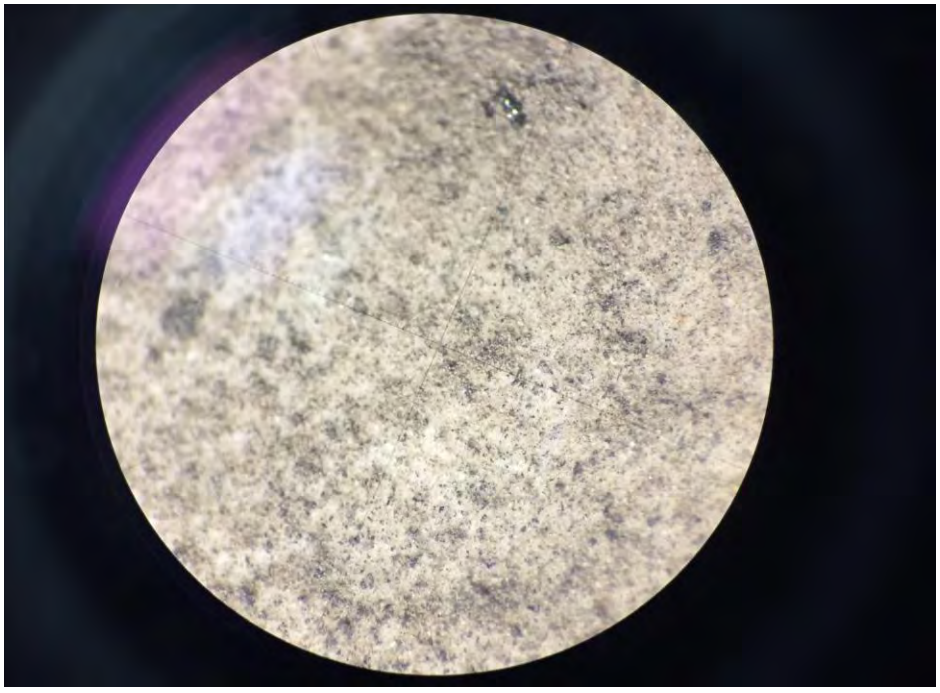
Engineering & Environmental Solutions, LLC

Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: Pond 1

1-2



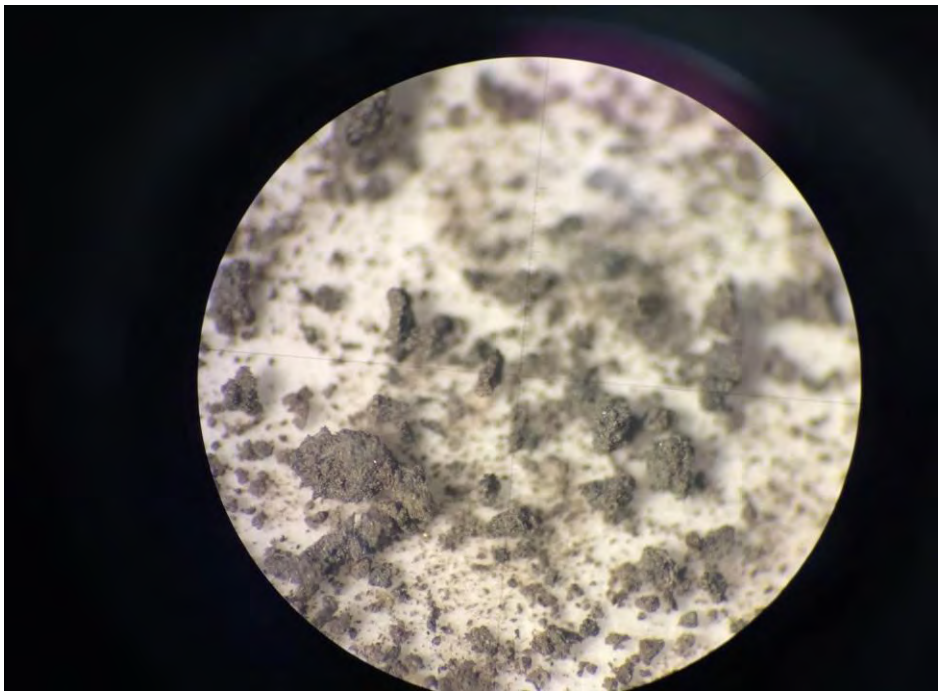


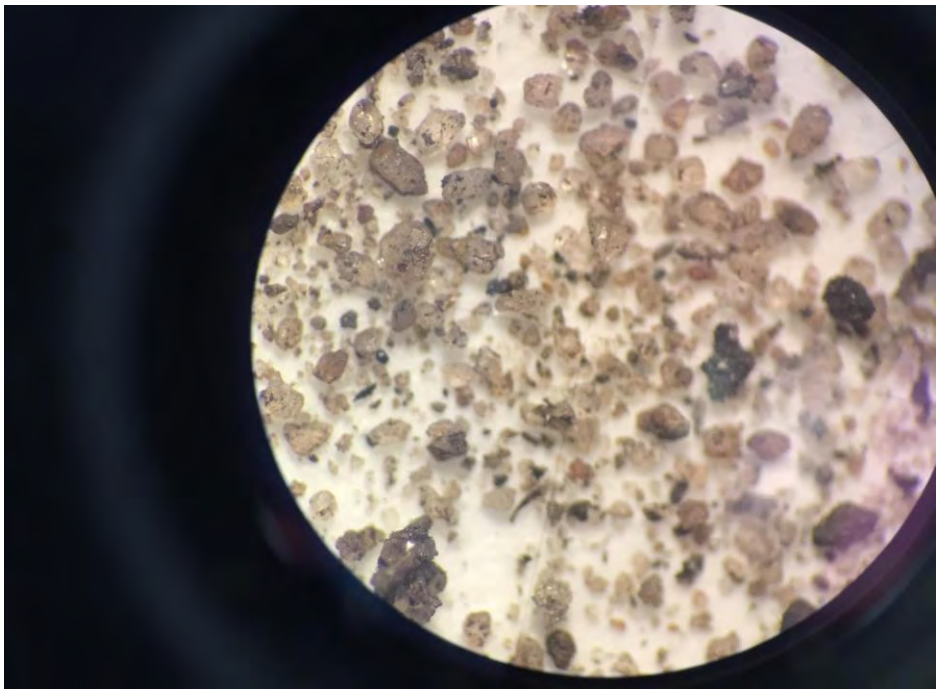
Engineering & Environmental Solutions, LLC

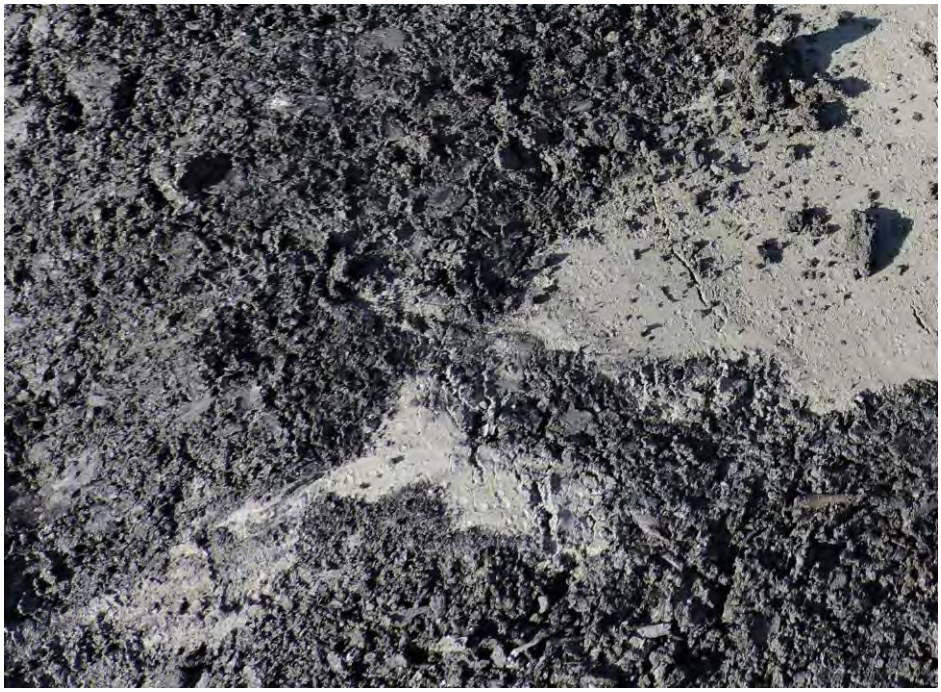
Microscope Evaluation

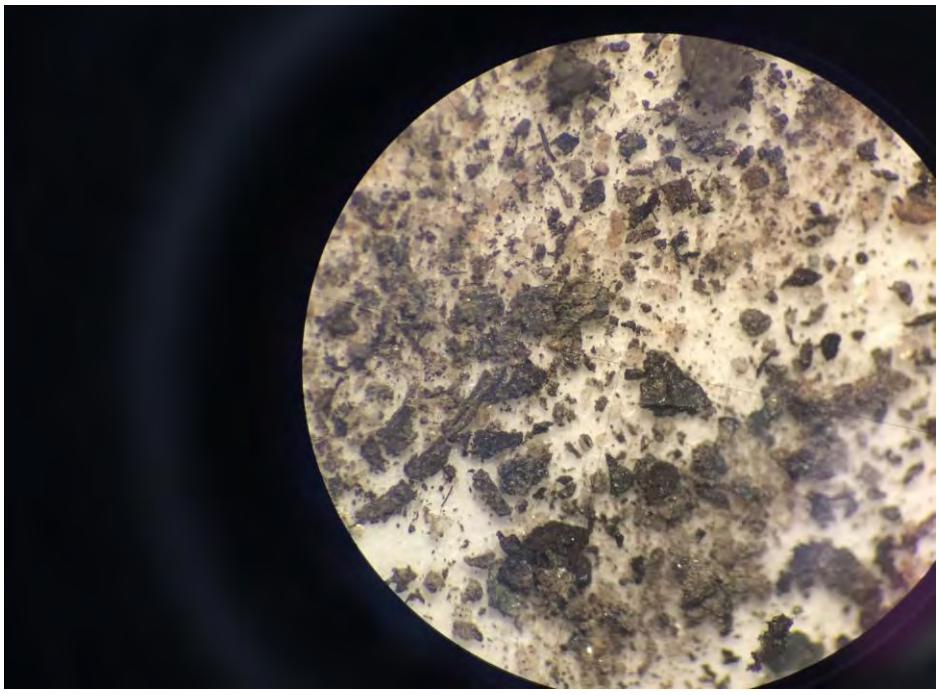
Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: Pond 2

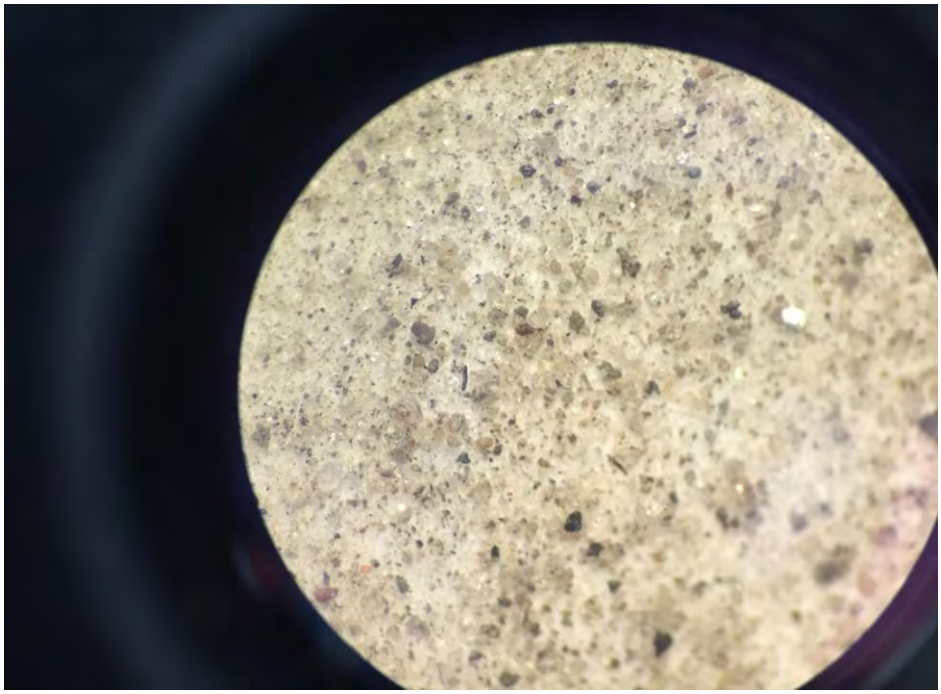
2-1

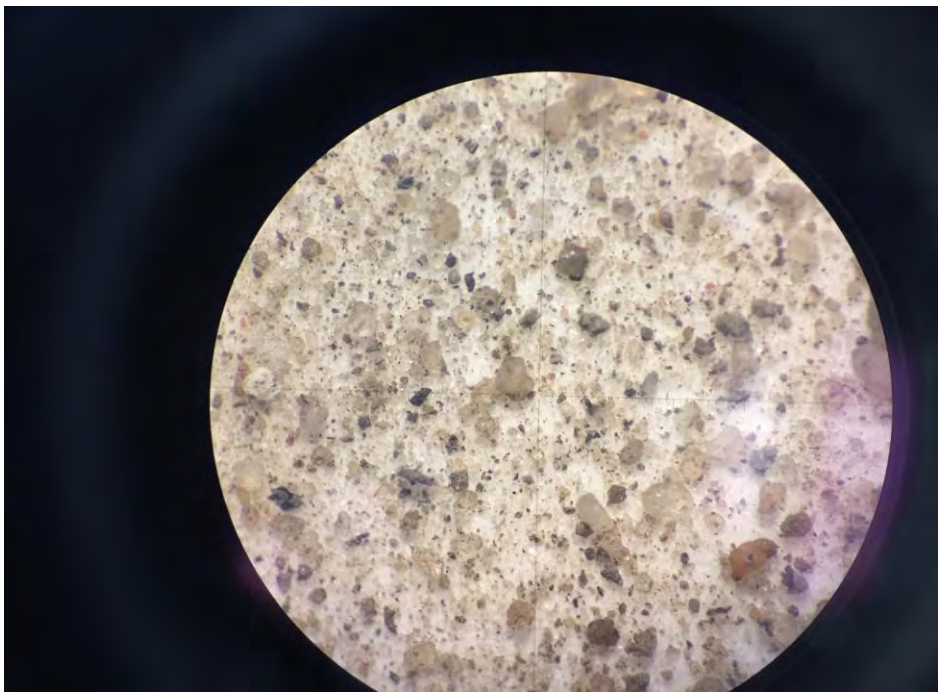


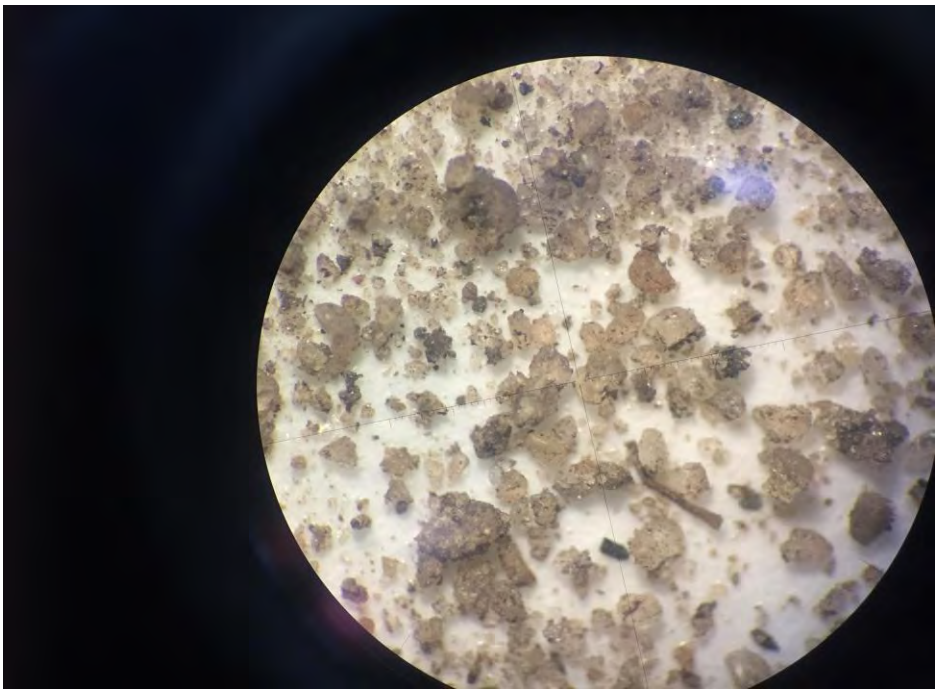








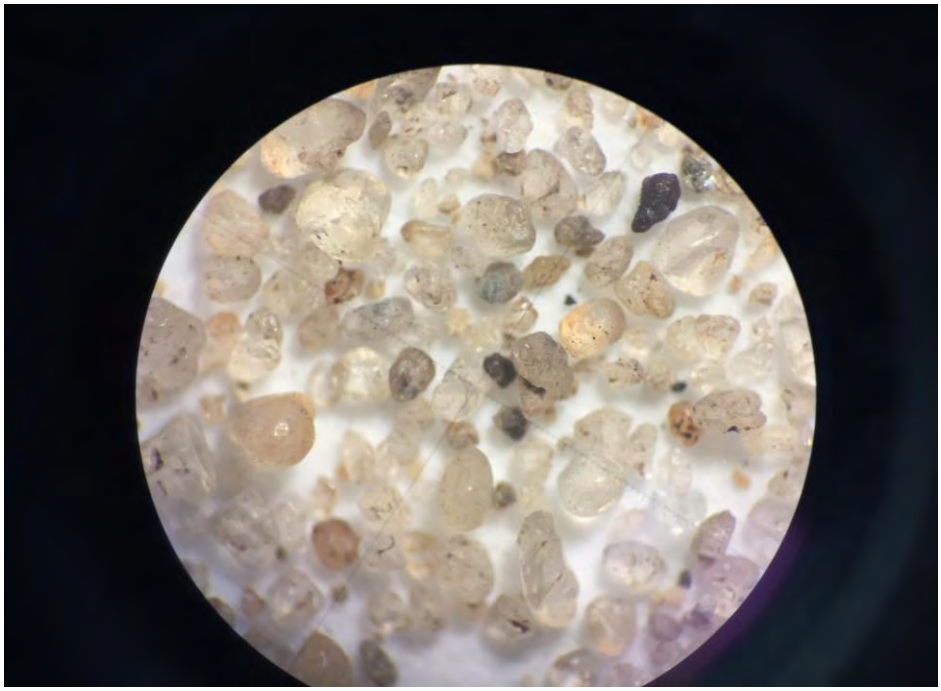




Engineering & Environmental Solutions, LLC

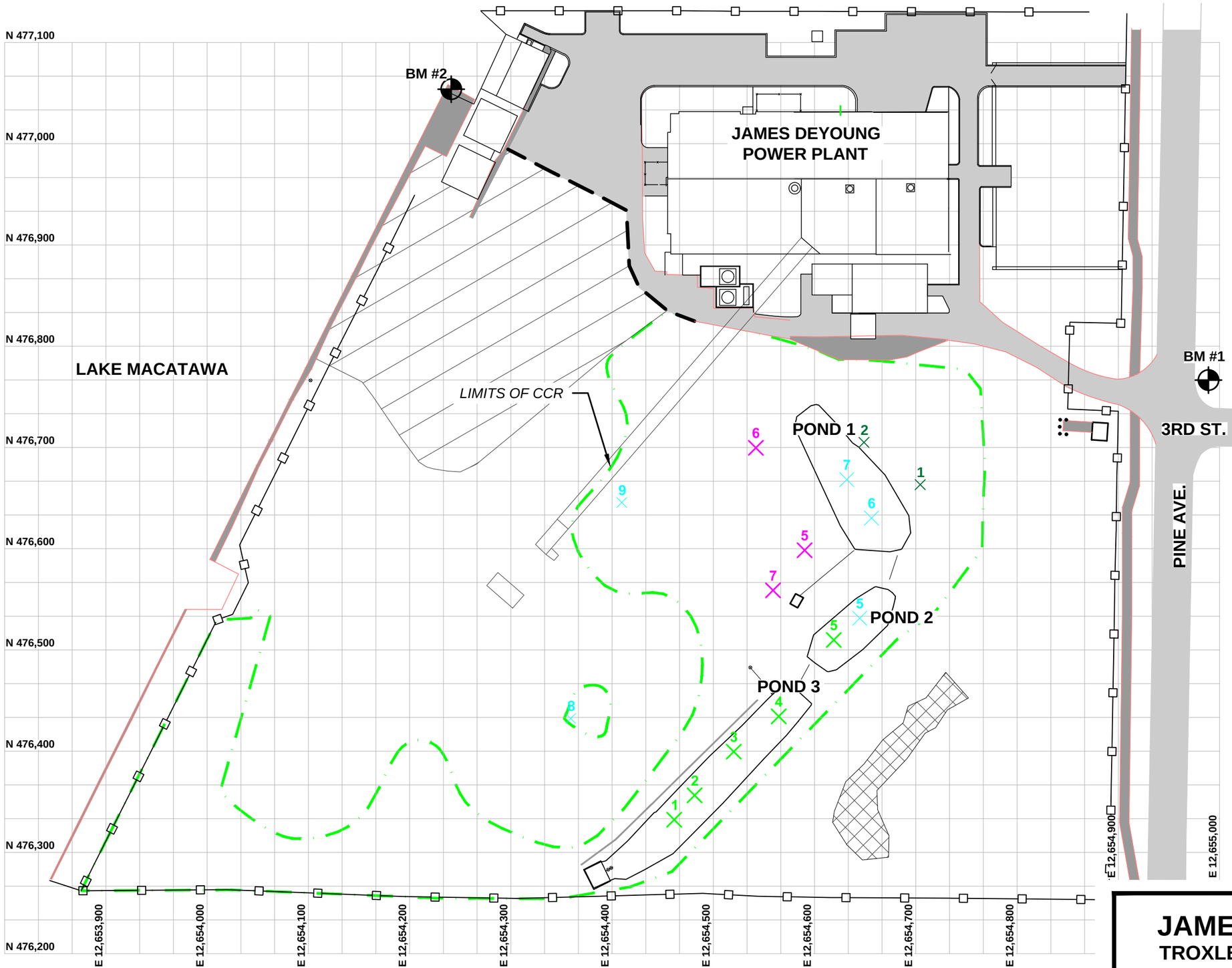
Microscope Evaluation

Project: Holland BPW Coal Yard Pile Closure Project No: 133-17-001 Points: Pond 3 Weir



APPENDIX B.2

FIELD DENSITY TESTING LOCATIONS



LEGEND - LIFT 1

- APPROXIMATE LIMITS OF CCR
- EXISTING FENCE
- EXISTING BENCHMARK
- EXISTING LANDSCAPING
- DENSITY TEST LOCATION - 5/3/2018
- DENSITY TEST LOCATION - 5/4/2018
- DENSITY TEST LOCATION - 5/7/2018
- DENSITY TEST LOCATION - 6/1/2018

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

N

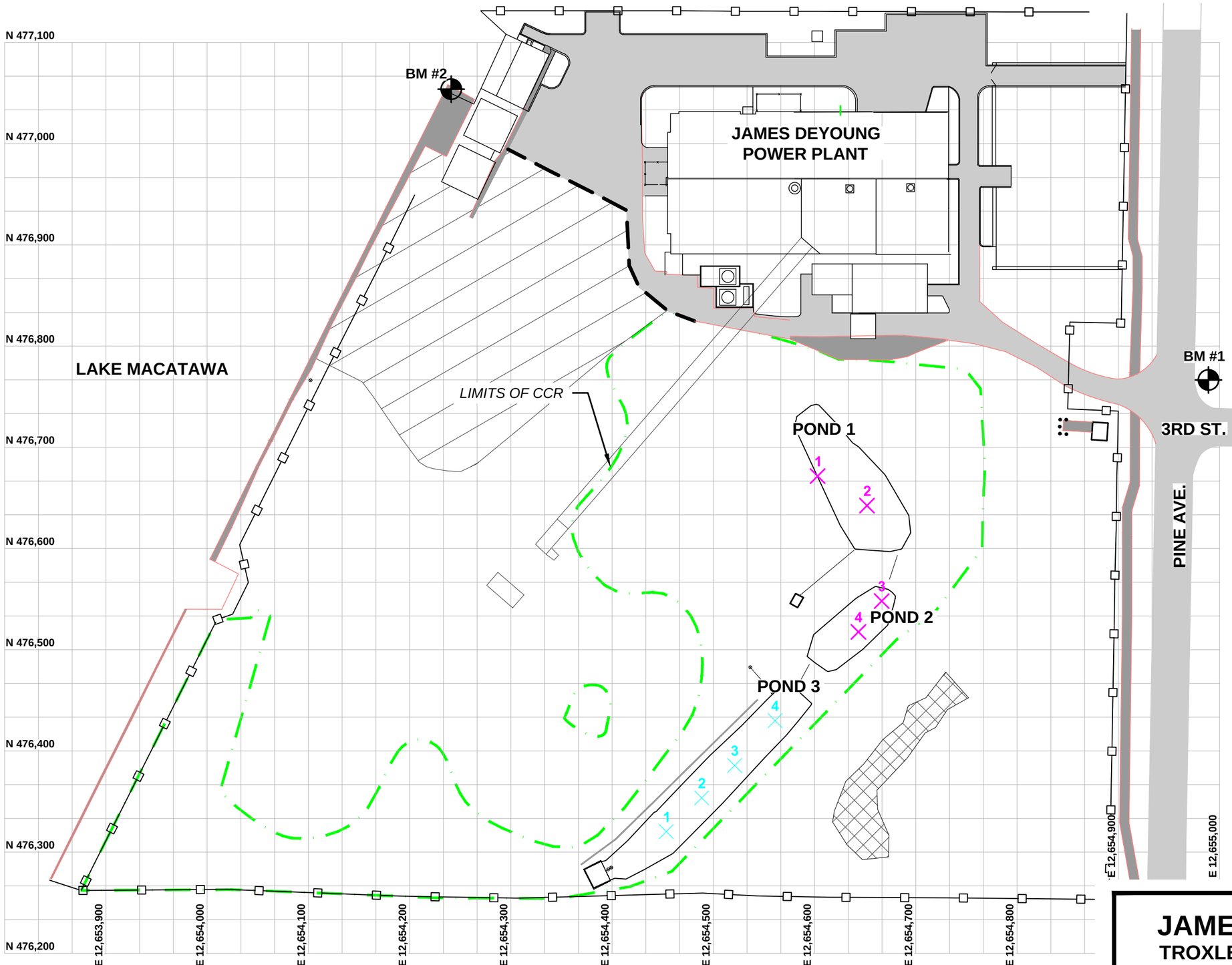
DRAFT

JAMES DEYOUNG POWER PLANT

TROXLER DENSITY GAUGE - TESTING LOCATIONS

LIFT 1

SCALE	1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET			1A	



LEGEND - LIFT 2

- APPROXIMATE LIMITS OF CCR
- EXISTING FENCE
- EXISTING BENCHMARK
- EXISTING LANDSCAPING
- DENSITY TEST LOCATION - 5/4/2018
- DENSITY TEST LOCATION - 5/7/2018

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

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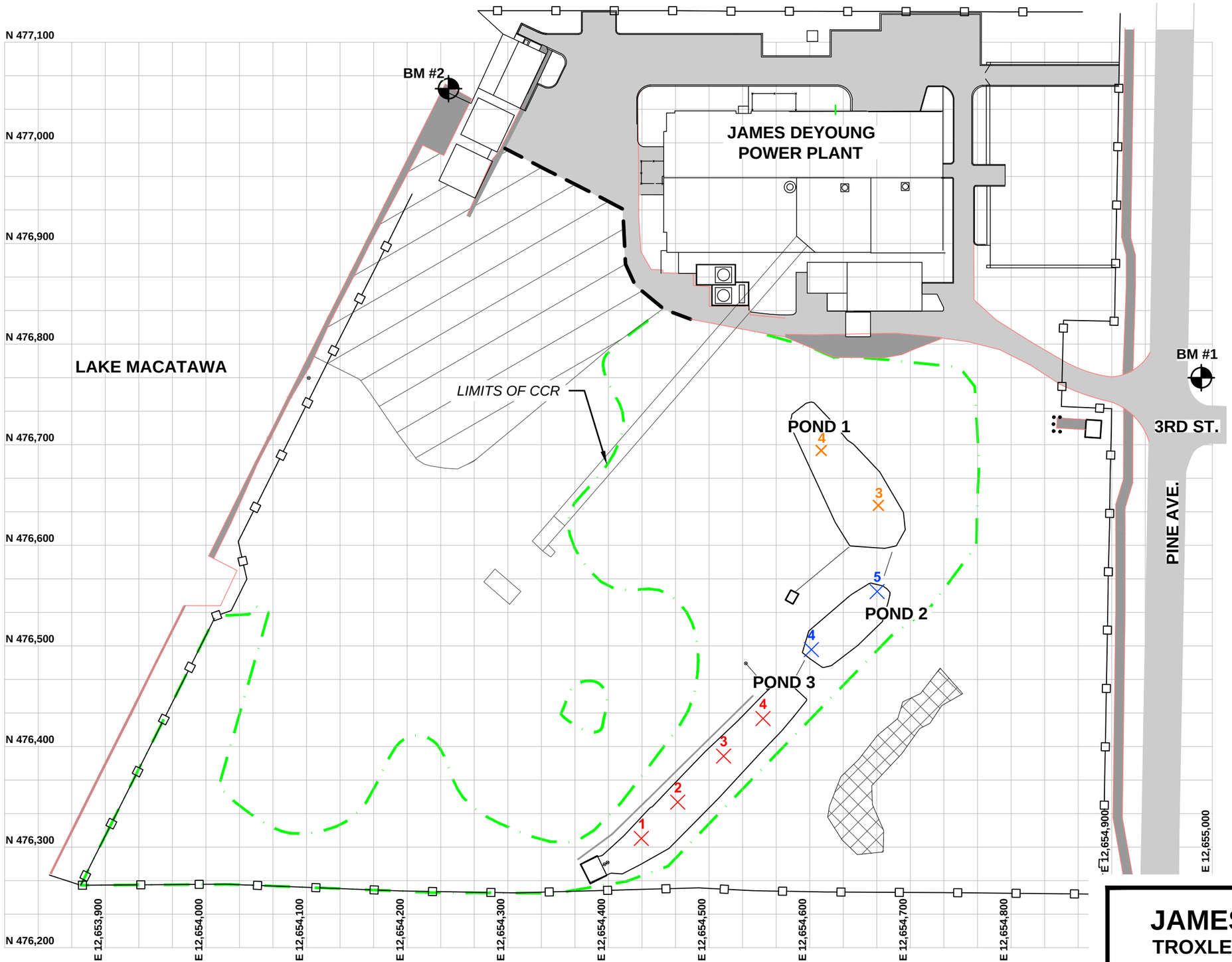
JAMES DEYOUNG POWER PLANT

TROXLER DENSITY GAUGE - TESTING LOCATIONS

LIFT 2

SCALE	1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET			1A	



LEGEND - LIFT 3

- APPROXIMATE LIMITS OF CCR
- EXISTING FENCE
- EXISTING BENCHMARK
- EXISTING LANDSCAPING
- DENSITY TEST LOCATION - 5/8/2018
- DENSITY TEST LOCATION - 5/9/2018
- DENSITY TEST LOCATION - 5/10/2018

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

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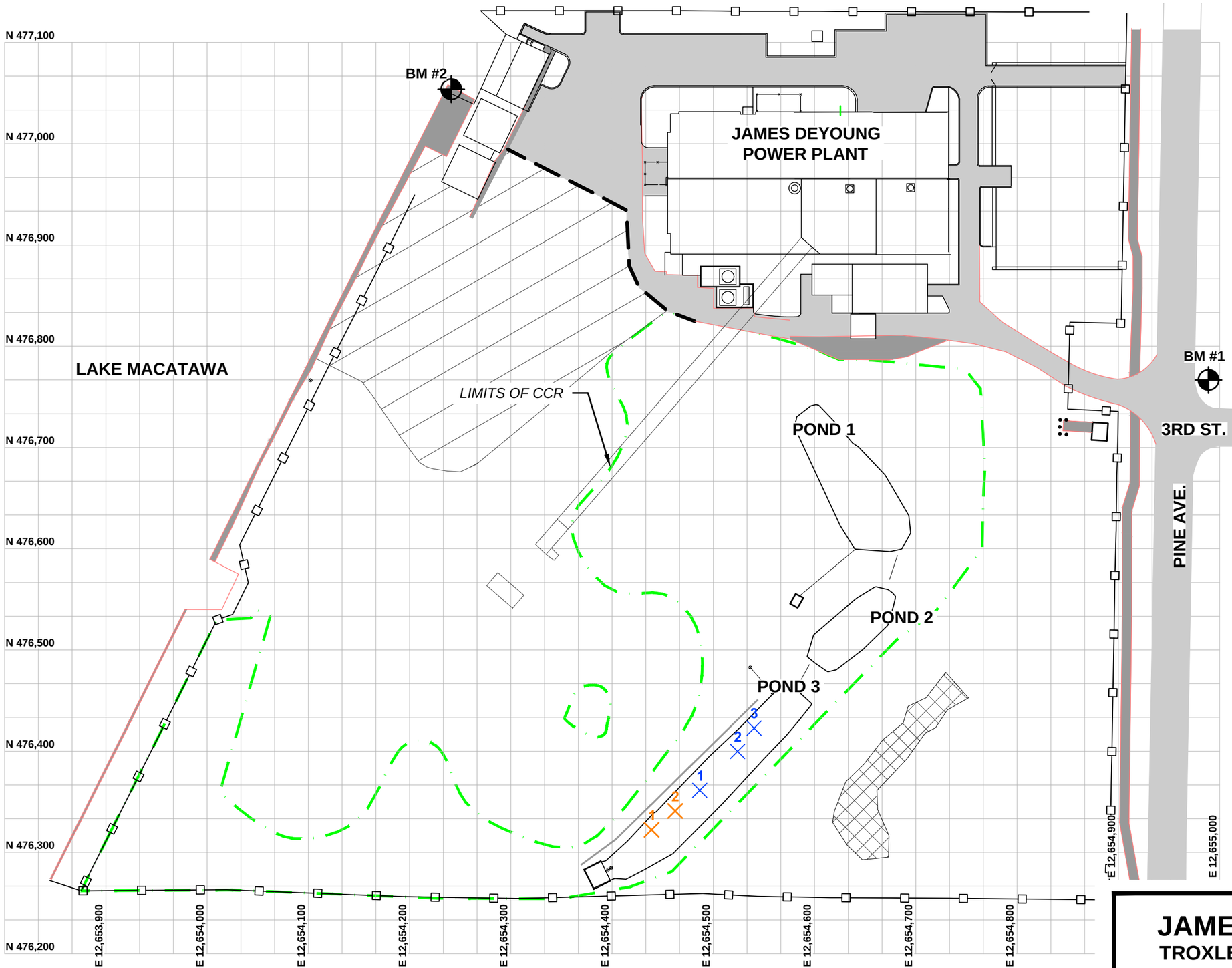
JAMES DEYOUNG POWER PLANT

TROXLER DENSITY GAUGE - TESTING LOCATIONS
LIFT 3

SCALE	1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET			1A	



LEGEND - LIFT 4

- APPROXIMATE LIMITS OF CCR
- EXISTING FENCE
- EXISTING BENCHMARK
- EXISTING LANDSCAPING
- DENSITY TEST LOCATION - 5/9/2018
- DENSITY TEST LOCATION - 5/10/2018

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

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JAMES DEYOUNG POWER PLANT

TROXLER DENSITY GAUGE - TESTING LOCATIONS

LIFT 4

SCALE	1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET			1A	

APPENDIX C.1

TOTAL CONCENTRATION SUMMARY TABLES

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				196	196 - Retest	4005	4009	4013	4014	4018
							10/13/17	4/20/18	5/8/18	11/8/17	5/17/18	5/17/18	11/13/17
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	**200**	<25	84	<21	<20	<21	<19
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000	1,500			<130			<110
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	***43,000***	2,700	**5,800**	4,100	1,500	1,300	960
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	**780,000**	7,800	17,000	7,000	5,900	6,400	4,500
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	3,200	<160	<210	<170	<180	<190	<150
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	8,700	<1,600	3,900	1,900	<1,800	2,000	<1,500
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	<140	<82	<110	120	<91	<97	<74
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)	11,000			2,000			2,200
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000	11,000			1,100			850
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	16,000	950	4,200	1,300	1,400	1,700	900
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	8,500	1,400	4,700	4,400	2,000	2,100	1,500
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	3,000	<410	4,200	1,100	<460	640	<370
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	***10,000***	270	***5,700***	560	950	490	530
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000	620			<210			<190
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)	84,000			<11,000			<11,000
Fluoride							3,600			<1,100			<1,100
Sulfate	NA	5.00E+06	NA	NA	ID	ID	2,000,000	430,000	110,000	51,000	78,000	29,000	44,000
Radium 226							<10.4						
Radium 228							<2						

Notes:

Underlined value is the highest applicable criteria (Residential Direct Contact must be met also if alternate testing is performed)

Bold indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria

Bold/italic indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria and Residential Contact value

G = Aquatic toxicity is proportional to water hardness; These GSI values have been calculated based on a water hardness of 220 ppm measured in a sample collected from Lake Macatawa.

X means the criteria is the drinking water standard if close to drinking water intake

Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4020	4025	4026	4030	4030 - retest	4032	4033
							5/8/18	11/8/17	11/13/17	4/23/18	5/1/18	5/9/18	5/18/18
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	<18	41	<22	20		<20	<19
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000		240	<130				
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	1,100	4,400	2,700	2,500		5,300	5,100
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	21,000	19,000	51,000	53,000		7,800	6,800
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	<160	2,700	<180	<170		<150	<180
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	<1,600	3,900	2,700	2,200		<1,500	1,800
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	<79	<980	<89	<83		77	<89
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)		2,400	3,300				
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000		***50,000***	1,800				
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	820	7,200	3,000	1,700		1,500	1,500
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	2,300	5,600	2,700	6,500		2,100	2,300
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	<390	<4,900	690	<410		3,700	4,700
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	**2,900**	**1,400**	810	**3,300**	**3,000**	700	**1,100**
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000		<250	<220				
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)		<12,000	<12,000				
Fluoride								1,300	2,100				
Sulfate	NA	5.00E+06	NA	NA	ID	ID	29,000	73,000	88,000	37,000		150,000	160,000
Radium 226													
Radium 228													

Notes:

Underlined value is the highest applicable criteria (Residential Direct Contact must be met also if alternate testing is performed)

Bold indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria

Bold/italic indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria and Residential Contact value

G = Aquatic toxicity is proportional to water hardness; These GSI values have been calculated based on a water hardness of 220 ppm measured in a sample collected from Lake Macatawa.

X means the criteria is the drinking water standard if close to drinking water intake

Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4037	4038	4053	4055	4055-retest	4055- retest 2	4063
							4/18/18	4/18/18	5/7/18	4/23/18	4/25/18	5/1/18	4/23/18
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	**220**	**190**	<21	<23			<16
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000							
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	***7,400***	***6,700***	2,200	3,900			1,900
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	160,000	170,000	8,000	22,000			4,700
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	630	830	<160	<190			<160
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	20,000	19,000	1,700	3,900			1,600
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	490	620	<81	<94			<79
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)							
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000							
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	37,000	34,000	1,300	2,700			3,300
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	***23,000***	***32,000***	1,800	2,800			2,500
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	<860	<730	<410	12,000			1,000
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	**3,100**	**3,400**	**1,600**	***5,200***	**1,700**	***4,500***	<79
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000							
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)							
Fluoride													
Sulfate	NA	5.00E+06	NA	NA	ID	ID	24,000	<21,000	32,000	59,000			15,000
Radium 226													
Radium 228													

Notes:

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G = Aquatic toxicity is proportional to water hardness; These GSI values have been calculated based on a water hardness of 220 ppm measured in a sample collected from Lake Macatawa.

X means the criteria is the drinking water standard if close to drinking water intake

Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4066	4068	4068 Retest	4075	4078	4078 Retest	4079
							4/23/18	10/5/17	10/20/17	5/1/18	10/5/17	10/20/17	4/23/18
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	<21	62		<20	<17		22
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000		300			<120		
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	**6,600**	***12,000***	***25,000***	2,900	***7,800***	***6,100***	2,300
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	9,800	96,000		14,000	22,000		8,700
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	<160	870		<190	160		<190
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	3,100	6,300		2,400	3,100		2,200
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	<81	**18,000**	350	<94	<78		100
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)		5,200			5,600		
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000		8,100			5,300		
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	1,500	9,300		3,700	9,800		4,900
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	2,300	6,400		2,900	3,700		2,400
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	37,000	780		2,800	470		1,600
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	190	**3,100**		850	**2,600**		370
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000		<210			<200		
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)		270,000			20,000		
Fluoride								<5,700			<1,000		
Sulfate	NA	5.00E+06	NA	NA	ID	ID	56,000	5,000,000		38,000	110,000		250,000
Radium 226								<5.4			<4.5		
Radium 228								<1.17			<1.33		

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Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4083	4084	4087	4089	4094	4096	4102
							4/25/18	11/7/17	4/25/18	11/14/17	5/1/18	11/9/17	4/27/18
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	<28	22	39	<22	<19	29	<17
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000		<130		<140		<140	
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	3,000	3,300	5,200	950	1,600	***17,000***	2,300
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	41,000	24,000	14,000	10,000	12,000	25,000	6,300
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	330	190	<200	<180	<180	430	<170
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	11,000	5,300	2,300	<1,800	2,200	3,400	<1,700
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	210	<87	<100	<92	<90	210	<83
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)		5,400		2,500		6,700	
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000		3,200		1,500		3,300	
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	5,800	6,200	2,800	2,700	1,900	7,700	1,100
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	11,000	6,200	4,500	1,800	2,200	4,900	1,400
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	1,900	<430	15,000	<460	2,500	<470	930
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	**1,400**	1,200	**2,700**	600	560	**1,500**	280
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000		<220		<230		<230	
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)		67,000		35,000		<24,000	
Fluoride								<1,300		3,700		<2,400	
Sulfate	NA	5.00E+06	NA	NA	ID	ID	16,000	520,000	51,000	750,000	130,000	2,100,000	170,000
Radium 226													
Radium 228													

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X means the criteria is the drinking water standard if close to drinking water intake

Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4104	4109	4114	4117	4118	4120	4123
							4/30/18	11/2/17	11/2/17	11/2/17	11/2/17	11/2/17	11/2/17
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	24	<17	<20	24	35	<18	23
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000		<130	<110	<110	<120	<130	<140
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	2,000	1,200	860	1,100	**5,800**	1,300	2,100
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	17,000	11,000	7,100	13,000	30,000	8,300	17,000
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	750	<170	<150	<140	170	260	<190
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	5,100	<1,700	<1,500	<1,400	2,700	<1,700	<1,900
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	<95	<84	<75	<72	190	<86	<93
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)		3,200	2,700	3,500	6,700	2,200	5,800
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000		1,200	910	1,600	6,300	2,200	1,400
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	3,000	5,900	2,800	5,300	12,000	4,500	6,800
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	4,200	1,600	1,500	2,100	4,200	1,400	2,500
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	<480	<420	<380	<360	<410	<430	<470
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	**1,300**	250	250	420	580	360	780
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000		<210	<190	<180	<210	<220	<230
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)		<11,000	13,000	<11,000	<12,000	19,000	<11,000
Fluoride								<1,100	<1,200	<1,100	<1,200	<1,100	<1,100
Sulfate	NA	5.00E+06	NA	NA	ID	ID	310,000	<11,000	46,000	85,000	260,000	210,000	14,000
Radium 226													
Radium 228													

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Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4124	4126	4126-2	4128	4140	4140-2	4144
							11/2/17	10/10/17	10/18/17	10/10/17	10/10/17	10/18/17	10/10/17
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	32	42	48	<17	57	50	26
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000	<140	700	<120	<120	500	180	<130
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	4,100	***14,000***	***14,000***	2,800	***11,000***	***11,000***	2,900
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	20,000	58,000	15,000	13,000	50,000	62,000	24,000
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	<180	1,500	270	820	1,100	270	590
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	2,800	16,000	2,400	3,600	8,400	3,300	4,300
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	100	2,200	310	560	240	<79	470
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)	4,200	10,000	6,900	2,900	5,300	3,800	4,100
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000	2,200	4,300	2,000	7,600	3,500	2,600	5,200
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	7,000	9,700	3,500	4,100	12,000	8,700	3,900
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	4,000	9,000	**3,300**	5,500	***12,000***	8,300	11,000
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	<450	2,200	2,300	<410	8,300	17,000	590
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	720	**3,300**	**1,100**	**1,200**	**2,700**	**1,600**	1,000
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000	<230	350	<190	<200	<210	<200	<220
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)	39,000	37,000	<12,000	<11,000	47,000	24,000	15,000
Fluoride							<1,200	<2,600	<1,200	<1,100	2,900	3,700	1,300
Sulfate	NA	5.00E+06	NA	NA	ID	ID	63,000	3,600,000	1,500,000	2,900,000	780,000	160,000	340,000
Radium 226								<6.2	<6.2	<6.1	<5.8		<5.9
Radium 228								<1.82	<1.8	<1.78	<1.9		<2.2

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Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4150	4151	4157	4164	4167	4169	4172
							4/27/18	4/20/18	10/10/17	4/16/18	11/2/17	5/30/18	5/29/18
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	<16	<21	**210**	23	<20	<22	<21
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000			610		<130		
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	5,800	630	5,300	1,900	1,400	860	2,100
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	6,200	5,600	43,000	18,000	12,000	3,300	4,300
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	<170	<170	240	<160	<170	<180	<180
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	<1,700	<1,700	6,600	<1,600	<1,700	<1,800	2,000
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	<87	<83	490	<82	<86	<88	<89
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)			11,000		3,000		
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000			3,100		1,200		
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	1,100	1,000	27,000	7,300	6,100	1,100	850
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	1,400	1,800	4,700	1,900	2,700	1,300	1,600
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	1,300	1,400	2,300	<410	<430	1,100	2,700
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	290	300	**1,100**	810	700	**2,400**	**1,100**
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000			<230		<220		
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)			130,000		21,000		
Fluoride									2,600		<1,100		
Sulfate	NA	5.00E+06	NA	NA	ID	ID	160,000	<12,000	430,000	<11,000	<11,000	14,000	<12,000
Radium 226									<5.5				
Radium 228									<1.79				

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TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4180						
							5/9/18						
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	<20						
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000							
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	1,100						
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	8,900						
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	<170						
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	<1,700						
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	<84						
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)							
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000							
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	2,000						
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	2,100						
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	<420						
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	460						
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000							
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)							
Fluoride													
Sulfate	NA	5.00E+06	NA	NA	ID	ID	<10,000						
Radium 226													
Radium 228													

Notes:

Underlined value is the highest applicable criteria (Residential Direct Contact must be met also if alternate testing is performed)

Bold indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria

Bold/italic indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria and Residential Contact value

G = Aquatic toxicity is proportional to water hardness; These GSI values have been calculated based on a water hardness of 220 ppm measured in a sample collected from Lake Macatawa.

X means the criteria is the drinking water standard if close to drinking water intake

Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 2

SUMMARY OF ANALYTICAL RESULTS - SPLP CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Sample Point				
				196	4025	4030	4037	4038
Antimony	6.0 (A)	6.0 (A)	130 (X)					
Arsenic	10 (A)	10 (A)	10	<5				
Barium (B)	2,000 (A)	2,000 (A)	1,000 (G)	84				
Beryllium	4.0 (A)	4.0 (A)	18 (G)					
Boron (B)	500 (F)	500 (F)	7,200 (X)					
Cadmium (B)	5.0 (A)	5.0 (A)	2.5 (G,X)					
Chloride	2.5E+5 (E)	2.5E+5 (E)	(FF)					
Chromium (III) (B,H)	100 (A)	100 (A)	120 (G,X)					
Chromium (VI)	100 (A)	100 (A)	11					
Cobalt	40	100	100		9.7			
Lead (B)	4.0 (L)	4.0 (L)	14 (G,X)					
Lithium (B)	170	350	440				14	<10
Mercury (Total) (B,Z)	2.0 (A)	2.0 (A)	0.0013	<0.2			<0.2	<0.2
Molybdenum (B)	73	210	3,200 (X)					
Selenium (B)	50 (A)	50 (A)	5	5.9		5.2	<5	<5
Sulfate	2.5E+5 (E)	2.5E+5 (E)	NA					
Thallium (B)	2.0 (A)	2.0 (A)	3.7 (X)					

Notes:

All concentrations in ug/l

TABLE 2

SUMMARY OF ANALYTICAL RESULTS - SPLP CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Sample Point				
				4055-Retest	4068	4083	4087	4126
Antimony	6.0 (A)	6.0 (A)	130 (X)					
Arsenic	10 (A)	10 (A)	10					<5
Barium (B)	2,000 (A)	2,000 (A)	1,000 (G)					
Beryllium	4.0 (A)	4.0 (A)	18 (G)					
Boron (B)	500 (F)	500 (F)	7,200 (X)					
Cadmium (B)	5.0 (A)	5.0 (A)	2.5 (G,X)		<1			
Chloride	2.5E+5 (E)	2.5E+5 (E)	(FF)					
Chromium (III) (B,H)	100 (A)	100 (A)	120 (G,X)					
Chromium (VI)	100 (A)	100 (A)	11					
Cobalt	40	100	100					
Lead (B)	4.0 (L)	4.0 (L)	14 (G,X)					
Lithium (B)	170	350	440					
Mercury (Total) (B,Z)	2.0 (A)	2.0 (A)	0.0013					
Molybdenum (B)	73	210	3,200 (X)					
Selenium (B)	50 (A)	50 (A)	5	12	<5	<5	<5	<5
Sulfate	2.5E+5 (E)	2.5E+5 (E)	NA					
Thallium (B)	2.0 (A)	2.0 (A)	3.7 (X)					

Notes:

All concentrations in ug/l

TABLE 2

SUMMARY OF ANALYTICAL RESULTS - SPLP CONCENTRATIONS

James DeYoung CCR Pond Closure

Hazardous Substance	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Sample Point				
				4140				
Antimony	6.0 (A)	6.0 (A)	130 (X)					
Arsenic	10 (A)	10 (A)	10					
Barium (B)	2,000 (A)	2,000 (A)	1,000 (G)					
Beryllium	4.0 (A)	4.0 (A)	18 (G)					
Boron (B)	500 (F)	500 (F)	7,200 (X)					
Cadmium (B)	5.0 (A)	5.0 (A)	2.5 (G,X)					
Chloride	2.5E+5 (E)	2.5E+5 (E)	(FF)					
Chromium (III) (B,H)	100 (A)	100 (A)	120 (G,X)					
Chromium (VI)	100 (A)	100 (A)	11					
Cobalt	40	100	100					
Lead (B)	4.0 (L)	4.0 (L)	14 (G,X)					
Lithium (B)	170	350	440	12				
Mercury (Total) (B,Z)	2.0 (A)	2.0 (A)	0.0013					
Molybdenum (B)	73	210	3,200 (X)					
Selenium (B)	50 (A)	50 (A)	5					
Sulfate	2.5E+5 (E)	2.5E+5 (E)	NA					
Thallium (B)	2.0 (A)	2.0 (A)	3.7 (X)					

Notes:

All concentrations in ug/l

APPENDIX C.2

LABORATORY ANALYSIS RESULTS FROM ALS

24-Oct-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **17101419**

Dear Blaine,

ALS Environmental received 2 samples on 20-Oct-2017 04:50 PM 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 industry accepted practices and Quality Control 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 9.

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

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **20-Oct-17 16:50**

Work Order: **17101419** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 20-Oct-17 (Date) Reviewed by: Bill Carey (eSignature) 23-Oct-17 (Date)

Matrices: Soil

Carrier name: Client

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):	17.2/17.2 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/20/2017 5:02:49 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:

ALS Group, USA

Date: 24-Oct-17

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **17101419**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 17101419
Sample ID: 4068 Retest
Lab ID: 17101419-01
Collection Date: 10/20/2017 04:28 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/23/17 12:38		Analyst: **JF**
Arsenic	**25**		**0.060**	**mg/Kg-dry**	1	10/23/2017 07:16 PM
Cadmium	**0.35**		**0.10**	**mg/Kg-dry**	1	10/23/2017 07:16 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**32**		**0.050**	**% of sample**	1	10/21/2017 09:40 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 17101419
Sample ID: 4078 Retest
Lab ID: 17101419-02
Collection Date: 10/20/2017 04:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/23/17 12:38		Analyst: **JF**
Arsenic	**6.1**		**0.050**	**mg/Kg-dry**	1	10/23/2017 07:18 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**18**		**0.050**	**% of sample**	1	10/21/2017 09:40 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 24-Oct-17

Client: Engineering & Environmental Solutions

Work Order: 17101419

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **109417** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-109417-109417** Units: **mg/Kg** Analysis Date: **10/23/2017 06:13 P**

Client ID: Run ID: **ICPMS3_171023A** SeqNo: **4716736** Prep Date: **10/23/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Cadmium	ND	0.10								

LCS Sample ID: **LCS-109417-109417** Units: **mg/Kg** Analysis Date: **10/23/2017 06:15 P**

Client ID: Run ID: **ICPMS3_171023A** SeqNo: **4716737** Prep Date: **10/23/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.908	0.25	5	0	98.2	80-120	0			
Cadmium	4.481	0.10	5	0	89.6	80-120	0			

MS Sample ID: **17101419-02AMS** Units: **mg/Kg** Analysis Date: **10/23/2017 07:20 P**

Client ID: **4078 Retest** Run ID: **ICPMS3_171023A** SeqNo: **4716777** Prep Date: **10/23/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.55	0.34	6.849	5.012	95.5	75-125	0			
Cadmium	6.155	0.14	6.849	-0.0003429	89.9	75-125	0			

MSD Sample ID: **17101419-02AMSD** Units: **mg/Kg** Analysis Date: **10/23/2017 07:21 P**

Client ID: **4078 Retest** Run ID: **ICPMS3_171023A** SeqNo: **4716778** Prep Date: **10/23/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.63	0.34	6.849	5.012	96.7	75-125	11.55	0.682	20	
Cadmium	6.143	0.14	6.849	-0.0003429	89.7	75-125	6.155	0.189	20	

The following samples were analyzed in this batch:

17101419-01A	17101419-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 17101419
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R222808** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R222808** Units: **% of sample** Analysis Date: **10/21/2017 09:40 P**
Client ID: Run ID: **MOIST_171021A** SeqNo: **4714267** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R222808** Units: **% of sample** Analysis Date: **10/21/2017 09:40 P**
Client ID: Run ID: **MOIST_171021A** SeqNo: **4714264** 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: **17101365-02A DUP** Units: **% of sample** Analysis Date: **10/21/2017 09:40 P**
Client ID: Run ID: **MOIST_171021A** SeqNo: **4714236** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	24.82	0.050	0	0	0	0-0	25.29	1.88	5	

DUP Sample ID: **17101365-04A DUP** Units: **% of sample** Analysis Date: **10/21/2017 09:40 P**
Client ID: Run ID: **MOIST_171021A** SeqNo: **4714242** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	31.62	0.050	0	0	0	0-0	31.8	0.568	5	

The following samples were analyzed in this batch:

17101419-01A	17101419-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 38871

ALS Project Manager: | ALS Work Order #: 1710419

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CYAP	A	Arsenic, Cadmium
Work Order		Project Number	133-17-001	B	Arsenic
Company Name	Engineering & Environmental Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn		D	
Address	400 136th Ave Bldg 100 Suite B	Address	~~400 136th Ave Bldg 100, Suite B~~	E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip	~~Holland, MI 49424~~	G	
Phone	(616) 931-3967	Phone		H	
Fax	(616) 931-3970	Fax		I	
e-Mail Address	Blaine.litteral@goeesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4068 Retest	10/20/17	4:28p	~~Sand~~ Soil		1	X										
2	4078 retest	10/20/17	4:30p	Soil		1		X									
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ Other ☒ 2 BD ☐ 1 BD

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Relinquished by: Amy Mandrell	Date: 10/20/17	Time: 1650	Received by (Laboratory):
Logged by (Laboratory): DES	Date: 10/20/17	Time: 1700	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	17.2c

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Date: 24-Oct-17

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **17101419**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
17101419-01	4068 Retest	Soil		10/20/2017 16:28	10/20/2017 16:50	☐
17101419-02	4078 Retest	Soil		10/20/2017 16:30	10/20/2017 16:50	☐

08-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James Deyoung CYAP** Work Order: **1711272**

Dear Blaine,

ALS Environmental received 8 samples on 03-Nov-2017 11:35 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 industry accepted practices and Quality Control 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 21.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Chad Whelton

Bill Carey
Project Manager

Certificate No: MN 998501

ALS Group, USA

Date: 08-Nov-17

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: **1711272**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1711272-01	4109	Soil		11/2/2017 16:08	11/3/2017 11:35	☐
1711272-02	4114	Soil		11/2/2017 16:02	11/3/2017 11:35	☐
1711272-03	4117	Soil		11/2/2017 16:05	11/3/2017 11:35	☐
1711272-04	4118	Soil		11/2/2017 15:34	11/3/2017 11:35	☐
1711272-05	4120	Soil		11/2/2017 15:51	11/3/2017 11:35	☐
1711272-06	4123	Soil		11/2/2017 15:44	11/3/2017 11:35	☐
1711272-07	4124	Soil		11/2/2017 15:29	11/3/2017 11:35	☐
1711272-08	4167	Soil		11/2/2017 15:40	11/3/2017 11:35	☐

ALS Group, USA

Date: 08-Nov-17

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
WorkOrder: **1711272**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *08-Nov-17*

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: 1711272
Sample ID: 4109
Lab ID: 1711272-01
Collection Date: 11/2/2017 04:08 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/7/17 10:17		Analyst: **RSH**
Mercury	ND		0.017	mg/Kg-dry	1	11/7/2017 01:03 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/6/17 14:28		Analyst: **JF**
Antimony	ND		0.13	mg/Kg-dry	1	11/6/2017 09:22 PM
Arsenic	**1.2**		**0.050**	**mg/Kg-dry**	1	11/6/2017 09:22 PM
Barium	**11**		**0.42**	**mg/Kg-dry**	1	11/6/2017 09:22 PM
Beryllium	ND		0.17	mg/Kg-dry	1	11/7/2017 02:02 PM
Boron	ND		1.7	mg/Kg-dry	1	11/7/2017 02:02 PM
Cadmium	ND		0.084	mg/Kg-dry	1	11/6/2017 09:22 PM
Chromium	**3.2**		**0.42**	**mg/Kg-dry**	1	11/6/2017 09:22 PM
Cobalt	**1.2**		**0.21**	**mg/Kg-dry**	1	11/6/2017 09:22 PM
Lead	**5.9**		**0.42**	**mg/Kg-dry**	1	11/6/2017 09:22 PM
Lithium	**1.6**		**0.17**	**mg/Kg-dry**	1	11/7/2017 02:02 PM
Molybdenum	ND		0.42	mg/Kg-dry	1	11/6/2017 09:22 PM
Selenium	**0.25**		**0.084**	**mg/Kg-dry**	1	11/6/2017 09:22 PM
Thallium	ND		0.21	mg/Kg-dry	1	11/6/2017 09:22 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/6/17 13:30		Analyst: **EE**
Chloride	ND		11	mg/Kg-dry	1	11/7/2017 12:58 PM
Fluoride	ND		1.1	mg/Kg-dry	1	11/7/2017 12:58 PM
Sulfate	ND		11	mg/Kg-dry	1	11/7/2017 12:58 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**8.5**		**0.050**	**% of sample**	1	11/4/2017 10:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP **Work Order:** 1711272
Sample ID: 4114 **Lab ID:** 1711272-02
Collection Date: 11/2/2017 04:02 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/7/17 10:17		Analyst: **RSH**
Mercury	ND		0.020	mg/Kg-dry	1	11/7/2017 01:05 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/6/17 14:28		Analyst: **JF**
Antimony	ND		0.11	mg/Kg-dry	1	11/6/2017 09:23 PM
Arsenic	**0.86**		**0.045**	**mg/Kg-dry**	1	11/6/2017 09:23 PM
Barium	**7.1**		**0.38**	**mg/Kg-dry**	1	11/6/2017 09:23 PM
Beryllium	ND		0.15	mg/Kg-dry	1	11/7/2017 02:03 PM
Boron	ND		1.5	mg/Kg-dry	1	11/7/2017 02:03 PM
Cadmium	ND		0.075	mg/Kg-dry	1	11/6/2017 09:23 PM
Chromium	**2.7**		**0.38**	**mg/Kg-dry**	1	11/6/2017 09:23 PM
Cobalt	**0.91**		**0.19**	**mg/Kg-dry**	1	11/6/2017 09:23 PM
Lead	**2.8**		**0.38**	**mg/Kg-dry**	1	11/6/2017 09:23 PM
Lithium	**1.5**		**0.15**	**mg/Kg-dry**	1	11/7/2017 02:03 PM
Molybdenum	ND		0.38	mg/Kg-dry	1	11/6/2017 09:23 PM
Selenium	**0.25**		**0.075**	**mg/Kg-dry**	1	11/6/2017 09:23 PM
Thallium	ND		0.19	mg/Kg-dry	1	11/6/2017 09:23 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/6/17 13:30		Analyst: **EE**
Chloride	**13**		**12**	**mg/Kg-dry**	1	11/7/2017 01:17 PM
Fluoride	ND		1.2	mg/Kg-dry	1	11/7/2017 01:17 PM
Sulfate	**46**		**12**	**mg/Kg-dry**	1	11/7/2017 01:17 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**15**		**0.050**	**% of sample**	1	11/4/2017 10:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *08-Nov-17*

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: 1711272
Sample ID: 4117
Lab ID: 1711272-03
Collection Date: 11/2/2017 04:05 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/7/17 10:17		Analyst: **RSH**
Mercury	**0.024**		**0.021**	**mg/Kg-dry**	1	11/7/2017 01:08 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/6/17 14:28		Analyst: **JF**
Antimony	ND		0.11	mg/Kg-dry	1	11/6/2017 09:25 PM
Arsenic	**1.1**		**0.043**	**mg/Kg-dry**	1	11/6/2017 09:25 PM
Barium	**13**		**0.36**	**mg/Kg-dry**	1	11/6/2017 09:25 PM
Beryllium	ND		0.14	mg/Kg-dry	1	11/7/2017 02:05 PM
Boron	ND		1.4	mg/Kg-dry	1	11/7/2017 02:05 PM
Cadmium	ND		0.072	mg/Kg-dry	1	11/6/2017 09:25 PM
Chromium	**3.5**		**0.36**	**mg/Kg-dry**	1	11/6/2017 09:25 PM
Cobalt	**1.6**		**0.18**	**mg/Kg-dry**	1	11/6/2017 09:25 PM
Lead	**5.3**		**0.36**	**mg/Kg-dry**	1	11/6/2017 09:25 PM
Lithium	**2.1**		**0.14**	**mg/Kg-dry**	1	11/7/2017 02:05 PM
Molybdenum	ND		0.36	mg/Kg-dry	1	11/6/2017 09:25 PM
Selenium	**0.42**		**0.072**	**mg/Kg-dry**	1	11/6/2017 09:25 PM
Thallium	ND		0.18	mg/Kg-dry	1	11/6/2017 09:25 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/6/17 13:30		Analyst: **EE**
Chloride	ND		11	mg/Kg-dry	1	11/7/2017 01:36 PM
Fluoride	ND		1.1	mg/Kg-dry	1	11/7/2017 01:36 PM
Sulfate	**85**		**11**	**mg/Kg-dry**	1	11/7/2017 01:36 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**10**		**0.050**	**% of sample**	1	11/4/2017 10:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP **Work Order:** 1711272
Sample ID: 4118 **Lab ID:** 1711272-04
Collection Date: 11/2/2017 03:34 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/7/17 10:17		Analyst: **RSH**
Mercury	**0.035**		**0.019**	**mg/Kg-dry**	1	11/7/2017 01:18 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/6/17 14:28		Analyst: **JF**
Antimony	ND		0.12	mg/Kg-dry	1	11/6/2017 09:31 PM
Arsenic	**5.8**		**0.050**	**mg/Kg-dry**	1	11/6/2017 09:31 PM
Barium	**30**		**0.41**	**mg/Kg-dry**	1	11/6/2017 09:31 PM
Beryllium	**0.17**		**0.17**	**mg/Kg-dry**	1	11/7/2017 02:06 PM
Boron	**2.7**		**1.7**	**mg/Kg-dry**	1	11/7/2017 02:06 PM
Cadmium	**0.19**		**0.083**	**mg/Kg-dry**	1	11/6/2017 09:31 PM
Chromium	**6.7**		**0.41**	**mg/Kg-dry**	1	11/6/2017 09:31 PM
Cobalt	**6.3**		**0.21**	**mg/Kg-dry**	1	11/6/2017 09:31 PM
Lead	**12**		**0.41**	**mg/Kg-dry**	1	11/6/2017 09:31 PM
Lithium	**4.2**		**0.17**	**mg/Kg-dry**	1	11/7/2017 02:06 PM
Molybdenum	ND		0.41	mg/Kg-dry	1	11/6/2017 09:31 PM
Selenium	**0.58**		**0.083**	**mg/Kg-dry**	1	11/6/2017 09:31 PM
Thallium	ND		0.21	mg/Kg-dry	1	11/6/2017 09:31 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/6/17 13:30		Analyst: **EE**
Chloride	ND		12	mg/Kg-dry	1	11/7/2017 01:55 PM
Fluoride	ND		1.2	mg/Kg-dry	1	11/7/2017 01:55 PM
Sulfate	**260**		**24**	**mg/Kg-dry**	2	11/7/2017 04:48 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**16**		**0.050**	**% of sample**	1	11/4/2017 10:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP **Work Order:** 1711272
Sample ID: 4120 **Lab ID:** 1711272-05
Collection Date: 11/2/2017 03:51 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/7/17 10:17		Analyst: **RSH**
Mercury	ND		0.018	mg/Kg-dry	1	11/7/2017 01:21 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/6/17 14:28		Analyst: **JF**
Antimony	ND		0.13	mg/Kg-dry	1	11/6/2017 09:33 PM
Arsenic	**1.3**		**0.052**	**mg/Kg-dry**	1	11/6/2017 09:33 PM
Barium	**8.3**		**0.43**	**mg/Kg-dry**	1	11/6/2017 09:33 PM
Beryllium	**0.26**		**0.17**	**mg/Kg-dry**	1	11/7/2017 02:08 PM
Boron	ND		1.7	mg/Kg-dry	1	11/7/2017 02:08 PM
Cadmium	ND		0.086	mg/Kg-dry	1	11/6/2017 09:33 PM
Chromium	**2.2**		**0.43**	**mg/Kg-dry**	1	11/6/2017 09:33 PM
Cobalt	**2.2**		**0.22**	**mg/Kg-dry**	1	11/6/2017 09:33 PM
Lead	**4.5**		**0.43**	**mg/Kg-dry**	1	11/6/2017 09:33 PM
Lithium	**1.4**		**0.17**	**mg/Kg-dry**	1	11/7/2017 02:08 PM
Molybdenum	ND		0.43	mg/Kg-dry	1	11/6/2017 09:33 PM
Selenium	**0.36**		**0.086**	**mg/Kg-dry**	1	11/6/2017 09:33 PM
Thallium	ND		0.22	mg/Kg-dry	1	11/6/2017 09:33 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/6/17 13:30		Analyst: **EE**
Chloride	**19**		**11**	**mg/Kg-dry**	1	11/7/2017 02:14 PM
Fluoride	ND		1.1	mg/Kg-dry	1	11/7/2017 02:14 PM
Sulfate	**210**		**11**	**mg/Kg-dry**	1	11/7/2017 02:14 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**14**		**0.050**	**% of sample**	1	11/4/2017 10:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP **Work Order:** 1711272
Sample ID: 4123 **Lab ID:** 1711272-06
Collection Date: 11/2/2017 03:44 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/7/17 10:17		Analyst: **RSH**
Mercury	**0.023**		**0.022**	**mg/Kg-dry**	1	11/7/2017 01:23 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/6/17 14:28		Analyst: **JF**
Antimony	ND		0.14	mg/Kg-dry	1	11/6/2017 09:34 PM
Arsenic	**2.1**		**0.056**	**mg/Kg-dry**	1	11/6/2017 09:34 PM
Barium	**17**		**0.47**	**mg/Kg-dry**	1	11/6/2017 09:34 PM
Beryllium	ND		0.19	mg/Kg-dry	1	11/7/2017 02:09 PM
Boron	ND		1.9	mg/Kg-dry	1	11/7/2017 02:09 PM
Cadmium	ND		0.093	mg/Kg-dry	1	11/6/2017 09:34 PM
Chromium	**5.8**		**0.47**	**mg/Kg-dry**	1	11/6/2017 09:34 PM
Cobalt	**1.4**		**0.23**	**mg/Kg-dry**	1	11/6/2017 09:34 PM
Lead	**6.8**		**0.47**	**mg/Kg-dry**	1	11/6/2017 09:34 PM
Lithium	**2.5**		**0.19**	**mg/Kg-dry**	1	11/7/2017 02:09 PM
Molybdenum	ND		0.47	mg/Kg-dry	1	11/6/2017 09:34 PM
Selenium	**0.78**		**0.093**	**mg/Kg-dry**	1	11/6/2017 09:34 PM
Thallium	ND		0.23	mg/Kg-dry	1	11/6/2017 09:34 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/6/17 13:30		Analyst: **EE**
Chloride	ND		11	mg/Kg-dry	1	11/7/2017 02:34 PM
Fluoride	ND		1.1	mg/Kg-dry	1	11/7/2017 02:34 PM
Sulfate	**14**		**11**	**mg/Kg-dry**	1	11/7/2017 02:34 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**15**		**0.050**	**% of sample**	1	11/4/2017 10:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *08-Nov-17*

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: 1711272
Sample ID: 4124
Lab ID: 1711272-07
Collection Date: 11/2/2017 03:29 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/7/17 10:17		Analyst: **RSH**
Mercury	**0.032**		**0.022**	**mg/Kg-dry**	1	11/7/2017 01:26 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/6/17 14:28		Analyst: **JF**
Antimony	ND		0.14	mg/Kg-dry	1	11/6/2017 09:36 PM
Arsenic	**4.1**		**0.054**	**mg/Kg-dry**	1	11/6/2017 09:36 PM
Barium	**20**		**0.45**	**mg/Kg-dry**	1	11/6/2017 09:36 PM
Beryllium	ND		0.18	mg/Kg-dry	1	11/7/2017 02:11 PM
Boron	**2.8**		**1.8**	**mg/Kg-dry**	1	11/7/2017 02:11 PM
Cadmium	**0.10**		**0.091**	**mg/Kg-dry**	1	11/6/2017 09:36 PM
Chromium	**4.2**		**0.45**	**mg/Kg-dry**	1	11/6/2017 09:36 PM
Cobalt	**2.2**		**0.23**	**mg/Kg-dry**	1	11/6/2017 09:36 PM
Lead	**7.0**		**0.45**	**mg/Kg-dry**	1	11/6/2017 09:36 PM
Lithium	**4.0**		**0.18**	**mg/Kg-dry**	1	11/7/2017 02:11 PM
Molybdenum	ND		0.45	mg/Kg-dry	1	11/6/2017 09:36 PM
Selenium	**0.72**		**0.091**	**mg/Kg-dry**	1	11/6/2017 09:36 PM
Thallium	ND		0.23	mg/Kg-dry	1	11/6/2017 09:36 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/6/17 13:30		Analyst: **EE**
Chloride	**39**		**12**	**mg/Kg-dry**	1	11/7/2017 02:53 PM
Fluoride	ND		1.2	mg/Kg-dry	1	11/7/2017 02:53 PM
Sulfate	**63**		**12**	**mg/Kg-dry**	1	11/7/2017 02:53 PM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**21**		**0.050**	**% of sample**	1	11/6/2017 09:34 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *08-Nov-17*

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: 1711272
Sample ID: 4167
Lab ID: 1711272-08
Collection Date: 11/2/2017 03:40 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/7/17 10:17		Analyst: **RSH**
Mercury	ND		0.020	mg/Kg-dry	1	11/7/2017 01:28 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/6/17 14:28		Analyst: **JF**
Antimony	ND		0.13	mg/Kg-dry	1	11/6/2017 09:37 PM
Arsenic	**1.4**		**0.052**	**mg/Kg-dry**	1	11/6/2017 09:37 PM
Barium	**12**		**0.43**	**mg/Kg-dry**	1	11/6/2017 09:37 PM
Beryllium	ND		0.17	mg/Kg-dry	1	11/7/2017 02:12 PM
Boron	ND		1.7	mg/Kg-dry	1	11/7/2017 02:12 PM
Cadmium	ND		0.086	mg/Kg-dry	1	11/6/2017 09:37 PM
Chromium	**3.0**		**0.43**	**mg/Kg-dry**	1	11/6/2017 09:37 PM
Cobalt	**1.2**		**0.22**	**mg/Kg-dry**	1	11/6/2017 09:37 PM
Lead	**6.1**		**0.43**	**mg/Kg-dry**	1	11/6/2017 09:37 PM
Lithium	**2.7**		**0.17**	**mg/Kg-dry**	1	11/7/2017 02:12 PM
Molybdenum	ND		0.43	mg/Kg-dry	1	11/6/2017 09:37 PM
Selenium	**0.70**		**0.086**	**mg/Kg-dry**	1	11/6/2017 09:37 PM
Thallium	ND		0.22	mg/Kg-dry	1	11/6/2017 09:37 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/6/17 13:30		Analyst: **EE**
Chloride	**21**		**11**	**mg/Kg-dry**	1	11/7/2017 03:12 PM
Fluoride	ND		1.1	mg/Kg-dry	1	11/7/2017 03:12 PM
Sulfate	ND		11	mg/Kg-dry	1	11/7/2017 03:12 PM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**14**		**0.050**	**% of sample**	1	11/6/2017 09:34 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **110173** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-110173-110173**				Units: **mg/Kg**			Analysis Date: **11/7/2017 12:44 PM**		
Client ID:	Run ID: **HG1_171107A**				SeqNo: **4745795**		Prep Date: **11/7/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-110173-110173**				Units: **mg/Kg**			Analysis Date: **11/7/2017 12:47 PM**		
Client ID:	Run ID: **HG1_171107A**				SeqNo: **4745796**		Prep Date: **11/7/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1742	0.020	0.1665	0	105	80-120	0			

MS	Sample ID: **1711018-01AMS**				Units: **mg/Kg**			Analysis Date: **11/7/2017 12:55 PM**		
Client ID:	Run ID: **HG1_171107A**				SeqNo: **4745798**		Prep Date: **11/7/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1437	0.016	0.1348	0.01057	98.8	75-125	0			

MSD	Sample ID: **1711018-01AMSD**				Units: **mg/Kg**			Analysis Date: **11/7/2017 12:58 PM**		
Client ID:	Run ID: **HG1_171107A**				SeqNo: **4745799**		Prep Date: **11/7/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1395	0.016	0.1359	0.01057	94.8	75-125	0.1437	3.01	35	

The following samples were analyzed in this batch:

1711272-01A	1711272-02A	1711272-03A
1711272-04A	1711272-05A	1711272-06A
1711272-07A	1711272-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711272
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110119** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-110119-110119** Units: **mg/Kg** Analysis Date: **11/6/2017 08:49 PM**
Client ID: Run ID: **ICPMS3_171106A** SeqNo: **4744245** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.25								
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	ND	0.10								
Chromium	0.0829	0.25								J
Cobalt	ND	0.25								
Lead	ND	0.25								
Molybdenum	ND	0.25								
Selenium	ND	0.25								
Thallium	ND	0.25								

MBLK Sample ID: **MBLK-110119-110119** Units: **mg/Kg** Analysis Date: **11/7/2017 01:42 PM**
Client ID: Run ID: **ICPMS3_171107A** SeqNo: **4745742** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Boron	0.05785	1.0								J
Lithium	ND	0.50								

LCS Sample ID: **LCS-110119-110119** Units: **mg/Kg** Analysis Date: **11/6/2017 08:51 PM**
Client ID: Run ID: **ICPMS3_171106A** SeqNo: **4744246** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.662	0.25	5	0	93.2	80-120	0			
Arsenic	4.58	0.25	5	0	91.6	80-120	0			
Barium	4.526	0.25	5	0	90.5	80-120	0			
Cadmium	4.622	0.10	5	0	92.4	80-120	0			
Chromium	4.601	0.25	5	0	92	80-120	0			
Cobalt	4.374	0.25	5	0	87.5	80-120	0			
Lead	4.693	0.25	5	0	93.9	80-120	0			
Molybdenum	4.724	0.25	5	0	94.5	80-120	0			
Selenium	4.608	0.25	5	0	92.2	80-120	0			
Thallium	4.597	0.25	5	0	91.9	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711272
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110119** Instrument ID **ICPMS3** Method: **SW6020A**

LCS Sample ID: **LCS-110119-110119** Units: **mg/Kg** Analysis Date: **11/7/2017 01:44 PM**
Client ID: Run ID: **ICPMS3_171107A** SeqNo: **4745743** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.69	0.10	5	0	93.8	80-120	0			
Boron	23.69	1.0	25	0	94.8	80-120	0			
Lithium	4.708	0.50	5	0	94.2	80-120	0			

MS Sample ID: **1711101-02BMS** Units: **mg/Kg** Analysis Date: **11/6/2017 09:04 PM**
Client ID: Run ID: **ICPMS3_171106A** SeqNo: **4744254** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.717	0.39	7.8	0.03477	85.7	75-125	0			
Arsenic	7.852	0.39	7.8	1.256	84.6	75-125	0			
Barium	24.38	0.39	7.8	12.47	153	75-125	0			S
Cadmium	6.635	0.16	7.8	0.01859	84.8	75-125	0			
Chromium	10.24	0.39	7.8	3.698	83.8	75-125	0			
Cobalt	7.887	0.39	7.8	1.675	79.6	75-125	0			
Lead	8.924	0.39	7.8	1.195	99.1	75-125	0			
Molybdenum	7.435	0.39	7.8	0.4716	89.3	75-125	0			
Selenium	7.055	0.39	7.8	0.2728	86.9	75-125	0			
Thallium	7.471	0.39	7.8	0.01875	95.5	75-125	0			

MS Sample ID: **1711101-02BMS** Units: **mg/Kg** Analysis Date: **11/7/2017 01:48 PM**
Client ID: Run ID: **ICPMS3_171107A** SeqNo: **4745746** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.418	0.16	7.8	0.06055	94.3	75-125	0			
Boron	39.09	1.6	39	1.073	97.5	75-125	0			
Lithium	9.417	0.78	7.8	1.915	96.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711272
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110119** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **1711101-02BMSD** Units: **mg/Kg** Analysis Date: **11/6/2017 09:10 PM**
Client ID: Run ID: **ICPMS3_171106A** SeqNo: **4744259** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.777	0.39	7.776	0.03477	86.7	75-125	6.717	0.888	20	
Arsenic	7.892	0.39	7.776	1.256	85.3	75-125	7.852	0.515	20	
Barium	21.21	0.39	7.776	12.47	112	75-125	24.38	13.9	20	
Cadmium	6.566	0.16	7.776	0.01859	84.2	75-125	6.635	1.05	20	
Chromium	10.15	0.39	7.776	3.698	83	75-125	10.24	0.816	20	
Cobalt	7.765	0.39	7.776	1.675	78.3	75-125	7.887	1.55	20	
Lead	8.31	0.39	7.776	1.195	91.5	75-125	8.924	7.13	20	
Molybdenum	7.24	0.39	7.776	0.4716	87	75-125	7.435	2.66	20	
Selenium	6.97	0.39	7.776	0.2728	86.1	75-125	7.055	1.2	20	
Thallium	7.184	0.39	7.776	0.01875	92.1	75-125	7.471	3.91	20	

MSD Sample ID: **1711101-02BMSD** Units: **mg/Kg** Analysis Date: **11/7/2017 01:50 PM**
Client ID: Run ID: **ICPMS3_171107A** SeqNo: **4745747** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.371	0.16	7.776	0.06055	94	75-125	7.418	0.637	20	
Boron	38.91	1.6	38.88	1.073	97.3	75-125	39.09	0.454	20	
Lithium	9.406	0.78	7.776	1.915	96.3	75-125	9.417	0.112	20	

The following samples were analyzed in this batch:

1711272-01A	1711272-02A	1711272-03A
1711272-04A	1711272-05A	1711272-06A
1711272-07A	1711272-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711272
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110254** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-110254-110254** Units: **mg/Kg** Analysis Date: **11/7/2017 12:19 PM**
Client ID: Run ID: **IC4_171107A** SeqNo: **4747768** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	10								
Fluoride	ND	1.0								
Sulfate	ND	10								

LCS Sample ID: **LCS-110254-110254** Units: **mg/Kg** Analysis Date: **11/7/2017 12:38 PM**
Client ID: Run ID: **IC4_171107A** SeqNo: **4747769** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	91.57	10	100	0	91.6	80-120	0			
Fluoride	18.84	1.0	20	0	94.2	80-120	0			
Sulfate	95.91	10	100	0	95.9	80-120	0			

MS Sample ID: **1711272-01A MS** Units: **mg/Kg** Analysis Date: **11/7/2017 04:10 PM**
Client ID: **4109** Run ID: **IC4_171107A** SeqNo: **4747782** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	89.27	9.8	97.66	5.195	86.1	75-125	0			
Fluoride	18.21	0.98	19.53	0.2475	91.9	75-125	0			
Sulfate	90.37	9.8	97.66	2.33	90.1	75-125	0			

MSD Sample ID: **1711272-01A MSD** Units: **mg/Kg** Analysis Date: **11/7/2017 04:29 PM**
Client ID: **4109** Run ID: **IC4_171107A** SeqNo: **4747783** Prep Date: **11/6/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	89.44	9.9	98.81	5.195	85.3	75-125	89.27	0.193	20	
Fluoride	18.28	0.99	19.76	0.2475	91.2	75-125	18.21	0.393	20	
Sulfate	92.29	9.9	98.81	2.33	91	75-125	90.37	2.1	20	

The following samples were analyzed in this batch:

1711272-01A	1711272-02A	1711272-03A
1711272-04A	1711272-05A	1711272-06A
1711272-07A	1711272-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711272
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **R223851** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R223851** Units: **% of sample** Analysis Date: **11/4/2017 10:00 PM**
Client ID: Run ID: **MOIST_171104A** SeqNo: **4741417** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R223851** Units: **% of sample** Analysis Date: **11/4/2017 10:00 PM**
Client ID: Run ID: **MOIST_171104A** SeqNo: **4741416** 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: **1711272-02A DUP** Units: **% of sample** Analysis Date: **11/4/2017 10:00 PM**
Client ID: **4114** Run ID: **MOIST_171104A** SeqNo: **4741402** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.72	0.050	0	0	0	0-0	15.43	1.86	5	

DUP Sample ID: **1711337-03A DUP** Units: **% of sample** Analysis Date: **11/4/2017 10:00 PM**
Client ID: Run ID: **MOIST_171104A** SeqNo: **4741414** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	13.34	0.050	0	0	0	0-0	13.39	0.374	5	

The following samples were analyzed in this batch:

1711272-01A	1711272-02A	1711272-03A
1711272-04A	1711272-05A	1711272-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711272
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **R223954** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **MB-R223954-R223954** Units: **% of sample** Analysis Date: **11/6/2017 09:34 AM**
Client ID: Run ID: **MOIST_171106A** SeqNo: **4744409** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R223954-R223954** Units: **% of sample** Analysis Date: **11/6/2017 09:34 AM**
Client ID: Run ID: **MOIST_171106A** SeqNo: **4744410** 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: **1711112-17B DUP** Units: **% of sample** Analysis Date: **11/6/2017 09:34 AM**
Client ID: Run ID: **MOIST_171106A** SeqNo: **4744423** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	20.11	0.050	0	0	0	0-0	19.78	1.65	5	

DUP Sample ID: **1711112-23B DUP** Units: **% of sample** Analysis Date: **11/6/2017 09:34 AM**
Client ID: Run ID: **MOIST_171106A** SeqNo: **4744430** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	18.61	0.050	0	0	0	0-0	18.96	1.86	5	

The following samples were analyzed in this batch: 1711272-07A 1711272-08A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 37816

ALS Project Manager: | ALS Work Order #: 1711272

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CAP	A	Metals (listed)
Work Order		Project Number	133-17-001	B	
Company Name	Engineering + Environmental Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn		D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	(616) 931-3967	Phone		H	
Fax	(616) 931-3970	Fax		I	
e-Mail Address	blaine.litteral@geesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4109	11/2/17 ~~10/31/17~~	4:08pm			1	X										
2	4114		4:02pm			1	X										
3	4117		4:05pm			1	X										
4	4118		3:34pm			1	X										
5	4120		3:51pm			1	X										
6	4123		3:44pm			1	X										
7	4124		3:29pm			1	X										
8	4167		3:40pm			1	X										
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell | Shipment Method: | Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☒ 2 BD ☐ 1 BD ☐ Other ____ | Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
Relinquished by: Amy Mandrell	Date: 11/3/17	Time: 1135	Received by (Laboratory):	
Logged by (Laboratory): NJF	Date: 11-3-17	Time: 1240	Checked by (Laboratory):	

Cooler ID	Cooler Temp
SR2	4.0

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract; services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP
Engineering + Environmental Solutions

Antimony

Arsenic

Barium

Beryllium

Boron

Cadmium

Chromium

Cobalt

Lead

Lithium

Mercury

Molybdenum

Selenium

Thallium

Sulfate

Fluoride

Chloride

Radium 226 & 228 Combined — hold off on, we will call whether to test or not

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **03-Nov-17 11:35**

Work Order: **1711272** Received by: **NCF**

Checklist completed by Nicole Fredericks (eSignature) 03-Nov-17 (Date) Reviewed by: Bill Carey (eSignature) 03-Nov-17 (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):	4.0/4.0	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/3/201712:49:05 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-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **JDY CYAP 133-17-001** Work Order: **1710360**

Dear Blaine,

ALS Environmental received 2 samples on 05-Oct-2017 02:38 PM 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 industry accepted practices and Quality Control 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 15.

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

ALS Group, USA

Date: 10-Nov-17

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001
Work Order: **1710360**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1710360-01	4068	Solid		10/5/2017 14:18	10/5/2017 14:38	☐
1710360-02	4078	Solid		10/5/2017 14:20	10/5/2017 14:38	☐

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001
WorkOrder: **1710360**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
as noted	
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

ALS Group, USA

Date: *10-Nov-17*

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710360
Sample ID: 4068 **Lab ID:** 1710360-01
Collection Date: 10/5/2017 02:18 PM **Matrix:** SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/12/17 15:53		Analyst: **RSH**
Mercury	**0.062**		**0.021**	**mg/Kg-dry**	1	10/13/2017 11:52 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/9/17 15:52		Analyst: **JF**
Antimony	**0.30**		**0.13**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Arsenic	**12**		**0.051**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Barium	**96**		**0.43**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Beryllium	**0.87**		**0.17**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Boron	**6.3**		**1.7**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Cadmium	**18**		**0.086**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Chromium	**5.2**		**0.43**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Cobalt	**8.1**		**0.21**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Lead	**9.3**		**0.43**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Lithium	**6.4**		**0.17**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Molybdenum	**0.78**		**0.43**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Selenium	**3.1**		**0.086**	**mg/Kg-dry**	1	10/10/2017 05:36 PM
Thallium	ND		0.21	mg/Kg-dry	1	10/10/2017 05:36 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 10/23/17 14:07		Analyst: **JF**
Cadmium	ND		0.0010	mg/L	1	10/23/2017 03:13 PM
Selenium	ND		0.0050	mg/L	1	10/23/2017 03:13 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/13/17 13:00		Analyst: **EE**
Chloride	**270**		**57**	**mg/Kg-dry**	5	10/14/2017 12:37 PM
Fluoride	ND		5.7	mg/Kg-dry	5	10/14/2017 12:37 PM
Sulfate	**5,000**		**570**	**mg/Kg-dry**	50	10/14/2017 12:56 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**12**		**0.050**	**% of sample**	1	10/9/2017 05:13 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	10/23/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *10-Nov-17*

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710360
Sample ID: 4078 **Lab ID:** 1710360-02
Collection Date: 10/5/2017 02:20 PM **Matrix:** SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/12/17 15:53		Analyst: **RSH**
Mercury	ND		0.017	mg/Kg-dry	1	10/13/2017 11:55 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/9/17 15:52		Analyst: **JF**
Antimony	ND		0.12	mg/Kg-dry	1	10/10/2017 05:37 PM
Arsenic	**7.8**		**0.047**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Barium	**22**		**0.39**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Beryllium	**0.16**	J	**0.16**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Boron	**3.1**		**1.6**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Cadmium	ND		0.078	mg/Kg-dry	1	10/10/2017 05:37 PM
Chromium	**5.6**		**0.39**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Cobalt	**5.3**		**0.20**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Lead	**9.8**		**0.39**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Lithium	**3.7**		**0.16**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Molybdenum	**0.47**		**0.39**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Selenium	**2.6**		**0.078**	**mg/Kg-dry**	1	10/10/2017 05:37 PM
Thallium	ND		0.20	mg/Kg-dry	1	10/10/2017 05:37 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/13/17 13:00		Analyst: **EE**
Chloride	**20**		**10**	**mg/Kg-dry**	1	10/14/2017 01:15 PM
Fluoride	ND		1.0	mg/Kg-dry	1	10/14/2017 01:15 PM
Sulfate	**110**		**10**	**mg/Kg-dry**	1	10/14/2017 01:15 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**6.8**		**0.050**	**% of sample**	1	10/9/2017 05:13 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	10/23/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 10-Nov-17

Client: Engineering & Environmental Solutions

Work Order: 1710360

Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **108951** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-108951-108951**				Units: **mg/Kg**			Analysis Date: **10/13/2017 11:16 A**		
Client ID:	Run ID: **HG1_171013A**				SeqNo: **4697857**		Prep Date: **10/12/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-108951-108951**				Units: **mg/Kg**			Analysis Date: **10/13/2017 11:19 A**		
Client ID:	Run ID: **HG1_171013A**				SeqNo: **4697858**		Prep Date: **10/12/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.15	0.020	0.1665	0	90.1	80-120	0			

MS	Sample ID: **1710392-01AMS**				Units: **mg/Kg**			Analysis Date: **10/13/2017 12:00 P**		
Client ID:	Run ID: **HG1_171013A**				SeqNo: **4697874**		Prep Date: **10/12/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1291	0.016	0.1309	-0.0003285	98.8	75-125	0			

MSD	Sample ID: **1710392-01AMSD**				Units: **mg/Kg**			Analysis Date: **10/13/2017 12:02 P**		
Client ID:	Run ID: **HG1_171013A**				SeqNo: **4697875**		Prep Date: **10/12/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1253	0.016	0.1297	-0.0003285	96.8	75-125	0.1291	2.96	35	

The following samples were analyzed in this batch: 1710360-01A 1710360-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710360
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **108716** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK	Sample ID: **MBLK-108716-108716**				Units: **mg/Kg**			Analysis Date: **10/10/2017 05:16 P**
Client ID:	Run ID: **ICPMS3_171010A**				SeqNo: **4690577**		Prep Date: **10/9/2017**	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.25								
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.2783	1.0								J
Cadmium	ND	0.10								
Chromium	0.01505	0.25								J
Cobalt	ND	0.25								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								
Thallium	ND	0.25								

LCS	Sample ID: **LCS-108716-108716**				Units: **mg/Kg**			Analysis Date: **10/10/2017 05:17 P**
Client ID:	Run ID: **ICPMS3_171010A**				SeqNo: **4690578**		Prep Date: **10/9/2017**	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.661	0.25	5	0	93.2	80-120	0			
Arsenic	4.776	0.25	5	0	95.5	80-120	0			
Beryllium	4.474	0.10	5	0	89.5	80-120	0			
Boron	23.58	1.0	25	0	94.3	80-120	0			
Cadmium	4.813	0.10	5	0	96.3	80-120	0			
Chromium	4.776	0.25	5	0	95.5	80-120	0			
Cobalt	4.785	0.25	5	0	95.7	80-120	0			
Lead	5.212	0.25	5	0	104	80-120	0			
Lithium	4.923	0.50	5	0	98.5	80-120	0			
Molybdenum	5.179	0.25	5	0	104	80-120	0			
Selenium	5.021	0.25	5	0	100	80-120	0			
Thallium	5.247	0.25	5	0	105	80-120	0			

LCS	Sample ID: **LCS-108716-108716**				Units: **mg/Kg**			Analysis Date: **10/11/2017 12:48 P**
Client ID:	Run ID: **ICPMS3_171011A**				SeqNo: **4692582**		Prep Date: **10/9/2017**	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	5.092	0.25	5	0	102	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710360
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **108716** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1710392-01AMS** Units: **mg/Kg** Analysis Date: **10/10/2017 05:45 P**

Client ID: Run ID: **ICPMS3_171010A** SeqNo: **4690596** Prep Date: **10/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	7.423	0.40	8.013	0.1261	91.1	75-125	0			
Arsenic	8.393	0.40	8.013	0.5618	97.7	75-125	0			
Barium	20.79	0.40	8.013	16	59.8	75-125	0			S
Beryllium	7.767	0.16	8.013	0.07464	96	75-125	0			
Boron	40.95	1.6	40.06	1.352	98.8	75-125	0			
Cadmium	7.849	0.16	8.013	0.4592	92.2	75-125	0			
Chromium	10.83	0.40	8.013	2.908	98.9	75-125	0			
Cobalt	7.769	0.40	8.013	2.48	66	75-125	0			S
Lead	19.67	0.40	8.013	11.02	108	75-125	0			
Lithium	10.78	0.80	8.013	2.979	97.4	75-125	0			
Molybdenum	8.563	0.40	8.013	0.4291	102	75-125	0			
Selenium	8.486	0.40	8.013	0.5799	98.7	75-125	0			
Thallium	8.306	0.40	8.013	0.00923	104	75-125	0			

MSD Sample ID: **1710392-01AMSD** Units: **mg/Kg** Analysis Date: **10/10/2017 05:46 P**

Client ID: Run ID: **ICPMS3_171010A** SeqNo: **4690597** Prep Date: **10/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	7.348	0.40	8.013	0.1261	90.1	75-125	7.423	1.02	20	
Arsenic	8.29	0.40	8.013	0.5618	96.4	75-125	8.393	1.24	20	
Barium	21.35	0.40	8.013	16	66.8	75-125	20.79	2.67	20	S
Beryllium	7.753	0.16	8.013	0.07464	95.8	75-125	7.767	0.19	20	
Boron	41.16	1.6	40.06	1.352	99.4	75-125	40.95	0.515	20	
Cadmium	7.79	0.16	8.013	0.4592	91.5	75-125	7.849	0.751	20	
Chromium	11.12	0.40	8.013	2.908	102	75-125	10.83	2.56	20	
Cobalt	7.827	0.40	8.013	2.48	66.7	75-125	7.769	0.75	20	S
Lead	29.94	0.40	8.013	11.02	236	75-125	19.67	41.4	20	SR
Lithium	10.68	0.80	8.013	2.979	96.1	75-125	10.78	0.968	20	
Molybdenum	8.508	0.40	8.013	0.4291	101	75-125	8.563	0.639	20	
Selenium	8.096	0.40	8.013	0.5799	93.8	75-125	8.486	4.71	20	
Thallium	8.298	0.40	8.013	0.00923	103	75-125	8.306	0.0975	20	

The following samples were analyzed in this batch: 1710360-01A 1710360-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710360
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **109412** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-109412-109412** Units: **mg/L** Analysis Date: **10/23/2017 03:10 P**
Client ID: Run ID: **ICPMS3_171023A** SeqNo: **4716615** Prep Date: **10/23/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	ND	0.0020								
Selenium	ND	0.0050								

LCS Sample ID: **LCS-109412-109412** Units: **mg/L** Analysis Date: **10/23/2017 03:11 P**
Client ID: Run ID: **ICPMS3_171023A** SeqNo: **4716616** Prep Date: **10/23/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	0.09533	0.0020	0.1	0	95.3	80-120	0			
Selenium	0.09732	0.0050	0.1	0	97.3	80-120	0			

MS Sample ID: **1710545-12AMS** Units: **mg/L** Analysis Date: **10/23/2017 03:16 P**
Client ID: Run ID: **ICPMS3_171023A** SeqNo: **4716619** Prep Date: **10/23/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	0.9476	0.020	1	0.00063	94.7	75-125	0			
Selenium	1.025	0.050	1	0.00207	102	75-125	0			

MSD Sample ID: **1710545-12AMSD** Units: **mg/L** Analysis Date: **10/23/2017 03:17 P**
Client ID: Run ID: **ICPMS3_171023A** SeqNo: **4716620** Prep Date: **10/23/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cadmium	0.9191	0.020	1	0.00063	91.8	75-125	0.9191	0	20	
Selenium	1.004	0.050	1	0.00207	100	75-125	1.004	0	20	

The following samples were analyzed in this batch: 1710360-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710360
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **109040** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-109040-109040** Units: **mg/Kg** Analysis Date: **10/14/2017 11:39 A**
Client ID: Run ID: **IC3_171014A** SeqNo: **4701220** Prep Date: **10/13/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	10								
Fluoride	ND	1.0								
Sulfate	ND	10								

LCS Sample ID: **LCS-109040-109040** Units: **mg/Kg** Analysis Date: **10/14/2017 11:58 A**
Client ID: Run ID: **IC3_171014A** SeqNo: **4701221** Prep Date: **10/13/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	104.3	10	100	0	104	80-120	0			
Fluoride	21.27	1.0	20	0	106	80-120	0			
Sulfate	107.2	10	100	0	107	80-120	0			

MS Sample ID: **1710360-02A MS** Units: **mg/Kg** Analysis Date: **10/14/2017 01:34 P**
Client ID: **4078** Run ID: **IC3_171014A** SeqNo: **4701226** Prep Date: **10/13/2017** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	113.7	20	98.62	18.42	96.7	75-125	0			
Fluoride	15.75	2.0	19.72	0.6865	76.4	75-125	0			
Sulfate	221.4	20	98.62	106.9	116	75-125	0			

MSD Sample ID: **1710360-02A MSD** Units: **mg/Kg** Analysis Date: **10/14/2017 01:53 P**
Client ID: **4078** Run ID: **IC3_171014A** SeqNo: **4701227** Prep Date: **10/13/2017** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	113.3	20	99.4	18.42	95.4	75-125	113.7	0.396	20	
Fluoride	16.51	2.0	19.88	0.6865	79.6	75-125	15.75	4.71	20	
Sulfate	216.6	20	99.4	106.9	110	75-125	221.4	2.19	20	

The following samples were analyzed in this batch: 1710360-01A 1710360-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710360
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **R221843** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R221843** Units: **% of sample** Analysis Date: **10/9/2017 05:13 PM**
Client ID: Run ID: **MOIST_171009D** SeqNo: **4688496** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R221843** Units: **% of sample** Analysis Date: **10/9/2017 05:13 PM**
Client ID: Run ID: **MOIST_171009D** SeqNo: **4688495** 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: **1710354-01B DUP** Units: **% of sample** Analysis Date: **10/9/2017 05:13 PM**
Client ID: Run ID: **MOIST_171009D** SeqNo: **4688480** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.71	0.050	0	0	0	0-0	14.84	0.88	5	

DUP Sample ID: **1710506-05A DUP** Units: **% of sample** Analysis Date: **10/9/2017 05:13 PM**
Client ID: Run ID: **MOIST_171009D** SeqNo: **4688494** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	12.85	0.050	0	0	0	0-0	13.5	4.93	5	

The following samples were analyzed in this batch: 1710360-01A 1710360-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 37814

ALS Environmental

ALS Project Manager: | ALS Work Order #: 1710360

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	JDY CYAP	A	Metals (listed) + Radium
Work Order		Project Number	133-17-001	B	
Company Name	E+E Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100, Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	616 931-3967	Phone		H	
Fax	616 931-3970	Fax		I	
e-Mail Address	blaine.litteral@gpEEsolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4068	10/5	2:18	Sand			X										
2	4078	10/5	2:20	Sand			X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Mitch Stark

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☒ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

	Date:	Time:		
Relinquished by:	10/5	2:38	Received by:	
Relinquished by:	10/5/17	1438	Received by (Laboratory):	
Logged by (Laboratory): KE	10/5/17	1625	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
SR2	3.0°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

- 4009
- 4013
- 4014
- 4018
- 4020
- 4024
- 4025
- 4026
- 4032
- 4033
- 4037
- 4038
- 4039
- 4053
- 4063
- 4064
- 4065
- 4066
- 4068
- 4078
- 4083
- 4084
- 4087
- 4088
- 4089
- 4096
- 4102
- 4104
- 4109
- 4114
- 4117
- 4118
- 4120
- 4122
- 4123
- 4124
- 4126
- 4140
- 4150
- 4151
- 4157
- 4164
- 4128
- 4144

Antimony
Arsenic
Barium
Beryllium
Boron
Cadmium
Chloride
Chromium
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Sulfate
Thallium
Radium 226 & 228 combined

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **05-Oct-17 14:38**

Work Order: **1710360** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 05-Oct-17 (Date) Reviewed by: Bill Carey (eSignature) 06-Oct-17 (Date)

Matrices: Soil
Carrier name: Client

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 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/5/2017 4:27:11 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:

Tuesday, November 07, 2017

Bill Carey
ALS Environmental
3352 128th Avenue
Holland, MI 49424

Re: ALS Workorder: 1710234
Project Name:
Project Number: 1710360

Dear Mr. Carey:

Two soil samples were received from ALS Environmental, on 10/11/2017. The samples were scheduled for the following analysis:

Gamma Spectroscopy

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
For Jeff R. Kujawa
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1710234

Gamma Spectroscopy:

The samples were analyzed for the presence of gamma emitting radionuclides according to HASL 300 Ga-01.

All acceptance criteria were met, with the following exceptions:

Radium-226 quantification based on the 186.21 keV photon suffers from interference with the 185.72 keV photon emitted by ^{235}U. Due to the high abundance of this photon in ^{235}U emissions, even small amounts of ^{235}U may bias the ^{226}Ra results high. Thus, any measured activity for ^{226}Ra has been flagged with an "SI" qualifier, denoting spectral interference.

The volume of samples 1710234-1, -1DUP, and -2 were not within 0.5 cm of the associated calibration volume as required per the current revision of SOP 739. Therefore, any reported results for these samples are flagged with a "J" qualifier, indicating the activity values to be an estimated value. Results are reported without further qualification.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1710234
Client Name: ALS Environmental
Client Project Name:
Client Project Number: 1710360
Client PO Number: 20-1710360

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
4068	1710234-1		SOIL	05-Oct-17	14:18
4078	1710234-2		SOIL	05-Oct-17	14:20

1710234

ALS Environmental

Subcontractor:
ALS Environmental, Fort Collins
225 Commerce Dr.
Fort Collins, CO 80524
TEL: (800) 443-1511
FAX:
Acct #:

CHAIN-OF-CUSTODY RECORD

Date: 10-Oct-17
COC ID: 8113
Due D ~~12-Oct-17~~ STD TAT

Salesperson	ALSHN Account

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	1710360	A	Subcontracted Analyses (SUBCONTRACT)
Work Order		Project Number		B	
Company Name	ALS Group USA, Corp	Bill To Company	ALS Group USA, Corp	C	
Send Report To	Bill Carey	Inv Attn	Accounts Payable	D	
Address	3352 128th Ave	Address	3352 128th Ave	E	
				F	
City/State/Zip	Holland, Michigan 49424	City/State/Zip	Holland, Michigan 49424	G	
Phone	(616) 399-6070	Phone	(616) 399-6070	H	
Fax	(616) 399-6185	Fax	(616) 399-6185	I	
eMail Address	bill.carey@alsglobal.com	eMail CC		J	

	ALS Sample ID	Client Sample ID	Matrix	Collection Date 24hr	Bottle	A	B	C	D	E	F	G	H	I	J
1	1710360-01A	4068	Solid	5/Oct/2017 14:18	(1) 4OZGNEAT	X									
2	1710360-02A	4078	Solid	5/Oct/2017 14:20	(1) 4OZGNEAT	X									

Comments:

Please analyze enclosed samples for Radium 226 and Radium 228. Thank you.

Relinquished by:	Date/Time	Received by:	Date/Time	Cooler IDs	Report/QC Level
	10/10/17 1400		10-11-17 0920		Std
Relinquished by:	Date/Time	Received by:	Date/Time		

5182

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS - MI Workorder No: 1710234

Project Manager: _____ Initials: CDN Date: 10-11-17

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	(N/A)	YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	**NO**
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	(N/A)	YES	NO
16. Were the samples shipped on ice?		YES	(NO)
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	(RAD ONLY)	YES	(NO)

Cooler #:	1							
Temperature (°C):	Amb							
No. of custody seals on cooler:	1							
DOT Survey/ Acceptance Information — External µR/hr reading:	9							
Background µR/hr reading:	10							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **(YES) / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? **YES / NO / (NA)** Contact: _____ Date/Time: _____

Project Manager Signature / Date: _____ 10-11-17

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

1710234

Dep:

Date: 10Oct17
Wgt: 2.45 LBS

DV:

Svcs: STANDARD OVERNIGHT
TRCK: 7261 2422 3197

SHIPPING: 22.3
SPECIAL: 1.0
HANDLING: 0.0
0.00 TOTAL: 23.3

ORIGIN ID:GRRA (616) 399-6070
SAMPLE RECEIVING
ALS ENVIRONMENTAL
3352 128TH AVENUE

HOLLAND, MI 494249263
UNITED STATES US

SHIP DATE: 10OCT17
ACTWGT: 2.45 LB
CAD: 0122071/CAFE3108

BILL SENDER

TO SAMPLER RECEIVING
ALS ENVIRONMENTAL
225 COMMERCE DR

FORT COLLINS CO 80524

9-1

(970) 490-1511
INV:
PO:
REF:
DEPT:

FedEx Express

TRK# 0201 7261 2422 3197

WED - 11 OCT 3:00
STANDARD OVERNIGH

NA FTCA

8052
CO-US DEI

Client:	ALS Environmental	**Date:**	*07-Nov-17*
Project:	1710360	**Work Order:**	1710234
Sample ID:	4068	**Lab ID:**	1710234-1
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/5/2017 14:18	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**		Prep Date: **10/15/2017**		PrepBy: **MRL**
Ra-226	ND (+/- 3.1)	U,G,SI,J	5.4	pCi/g	NA	10/23/2017 08:02
Ra-228	ND (+/- 0.77)	U,G,J	1.17	pCi/g	NA	10/23/2017 08:02

Client:	ALS Environmental	**Date:**	*07-Nov-17*
Project:	1710360	**Work Order:**	1710234
Sample ID:	4078	**Lab ID:**	1710234-2
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/5/2017 14:20	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**		Prep Date: **10/15/2017**		PrepBy: **MRL**
Ra-226	ND (+/- 2.5)	U,G,SI,J	4.5	pCi/g	NA	10/23/2017 08:03
Ra-228	ND (+/- 0.7)	U,G,J	1.33	pCi/g	NA	10/23/2017 08:03

Client:	ALS Environmental	**Date:**	*07-Nov-17*
Project:	1710360	**Work Order:**	1710234
Sample ID:	4078	**Lab ID:**	1710234-2
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/5/2017 14:20	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: **GS171015-1-1** Instrument ID: **GAMMA** Method: **Gamma Spectroscopy Results**

DUP Sample ID: **1710234-1** Units: **pCi/g** Analysis Date: **10/23/2017 09:16**

Client ID: **4068** Run ID: **GS171015-1B** Prep Date: **10/15/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	4.9						1.4	0.2	2.1	U,G,SI,J
Ra-228	ND	1.26						0.75	0.08	2.1	U,G,J

LCS Sample ID: **GS171015-1** Units: **pCi/g** Analysis Date: **10/23/2017 08:03**

Client ID: Run ID: **GS171015-1B** Prep Date: **10/15/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Am-241	1080 (+/- 130)	20	995.2		108	85-115					P
Co-60	381 (+/- 45)	2	394		96.8	85-115					P
Cs-137	380 (+/- 45)	2	374.3		101	85-115					P,M3

MB Sample ID: **GS171015-1** Units: **pCi/g** Analysis Date: **10/23/2017 09:15**

Client ID: Run ID: **GS171015-1B** Prep Date: **10/15/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Am-241	ND	2.2									U
Co-60	ND	0.107									U
Cs-137	ND	0.124									U
Ra-226	ND	1.83									U,SI
Ra-228	ND	0.41									U

The following samples were analyzed in this batch: 1710234-1 1710234-2

12-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **JDY CYAP 133-17-001** Work Order: **1710955**

Dear Blaine,

ALS Environmental received 2 samples on 13-Oct-2017 03:23 PM 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 industry accepted practices and Quality Control 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 25.

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

ALS Group, USA

Date: 12-Nov-17

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001
Work Order: **1710955**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1710955-01	196	Solid		10/13/2017 13:30	10/13/2017 15:23	☐
1710955-02	196 SPLP	Splp Extract		10/13/2017 13:30	10/13/2017 15:23	☐

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001
WorkOrder: **1710955**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
as noted	
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

ALS Group, USA

Date: *12-Nov-17*

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710955
Sample ID: 196 **Lab ID:** 1710955-01
Collection Date: 10/13/2017 01:30 PM **Matrix:** SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/17/17 12:37		Analyst: **RSH**
Mercury	**0.20**		**0.031**	**mg/Kg-dry**	1	10/19/2017 01:05 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/17/17 14:54		Analyst: **JF**
Antimony	**1.5**		**0.21**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Arsenic	**43**		**0.082**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Barium	**780**		**6.9**	**mg/Kg-dry**	10	10/18/2017 02:20 PM
Beryllium	**3.2**		**0.27**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Boron	**8.7**		**2.7**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Cadmium	ND		0.14	mg/Kg-dry	1	10/17/2017 08:44 PM
Chromium	**11**		**0.69**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Cobalt	**11**		**0.34**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Lead	**16**		**0.69**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Lithium	**8.5**		**0.27**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Molybdenum	**3.0**		**0.69**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Selenium	**10**		**0.14**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
Thallium	**0.62**		**0.34**	**mg/Kg-dry**	1	10/17/2017 08:44 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/19/17 11:00		Analyst: **EE**
Chloride	**84**		**17**	**mg/Kg-dry**	1	10/20/2017 11:37 AM
Fluoride	**3.6**		**1.7**	**mg/Kg-dry**	1	10/20/2017 11:37 AM
Sulfate	**2,000**		**330**	**mg/Kg-dry**	20	10/20/2017 12:35 PM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**41**		**0.050**	**% of sample**	1	10/16/2017 05:05 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See attached**			**as noted**	1	11/6/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *12-Nov-17*

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710955
Sample ID: 196 SPLP **Lab ID:** 1710955-02
Collection Date: 10/13/2017 01:30 PM **Matrix:** SPLP EXTRACT

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**		Prep: SW7470 11/8/17 12:33	Analyst: **RSH**
Mercury	ND		0.00020	mg/L	1	11/8/2017 01:51 PM
METALS BY ICP-MS			**SW6020A**		Prep: SW3005A 11/8/17 12:44	Analyst: **JF**
Arsenic	ND		0.0050	mg/L	1	11/8/2017 04:37 PM
Barium	**0.084**		**0.0050**	**mg/L**	1	11/8/2017 04:37 PM
Selenium	**0.0059**		**0.0050**	**mg/L**	1	11/8/2017 04:37 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **109155** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-109155-109155**				Units: **mg/Kg**			Analysis Date: **10/17/2017 01:02 P**		
Client ID:	Run ID: **HG1_171017A**				SeqNo: **4704802**			Prep Date: **10/17/2017**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-109155-109155**				Units: **mg/Kg**			Analysis Date: **10/17/2017 01:05 P**		
Client ID:	Run ID: **HG1_171017A**				SeqNo: **4704803**			Prep Date: **10/17/2017**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1525	0.020	0.1665	0	91.6	80-120	0			

MS	Sample ID: **1710992-03AMS**				Units: **mg/Kg**			Analysis Date: **10/17/2017 01:15 P**		
Client ID:	Run ID: **HG1_171017A**				SeqNo: **4704807**			Prep Date: **10/17/2017**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1635	0.016	0.1367	0.01166	111	75-125	0			

MSD	Sample ID: **1710992-03AMSD**				Units: **mg/Kg**			Analysis Date: **10/17/2017 01:18 P**		
Client ID:	Run ID: **HG1_171017A**				SeqNo: **4704808**			Prep Date: **10/17/2017**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1485	0.016	0.1361	0.01166	101	75-125	0.1635	9.6	35	

The following samples were analyzed in this batch: 1710955-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710955
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **110259** Instrument ID **HG1** Method: **SW7470A**

MBLK Sample ID: **MBLK-110259-110259** Units: **mg/L** Analysis Date: **11/8/2017 01:33 PM**
Client ID: Run ID: **HG1_171108A** SeqNo: **4748949** Prep Date: **11/8/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS Sample ID: **LCS-110259-110259** Units: **mg/L** Analysis Date: **11/8/2017 01:43 PM**
Client ID: Run ID: **HG1_171108A** SeqNo: **4748953** Prep Date: **11/8/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00202	0.00020	0.002	0	101	80-120	0			

MS Sample ID: **1711166-02BMS** Units: **mg/L** Analysis Date: **11/8/2017 02:04 PM**
Client ID: Run ID: **HG1_171108A** SeqNo: **4748961** Prep Date: **11/8/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00197	0.00020	0.002	-0.000002	98.6	75-125	0			

MSD Sample ID: **1711166-02BMSD** Units: **mg/L** Analysis Date: **11/8/2017 02:06 PM**
Client ID: Run ID: **HG1_171108A** SeqNo: **4748962** Prep Date: **11/8/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00187	0.00020	0.002	-0.000002	93.6	75-125	0.00197	5.21	20	

The following samples were analyzed in this batch: 1710955-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710955
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **109160** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-109160-109160** Units: **mg/Kg** Analysis Date: **10/17/2017 07:56 P**
Client ID: Run ID: **ICPMS3_171017A** SeqNo: **4706774** Prep Date: **10/17/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.25								
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	ND	1.0								
Cadmium	ND	0.10								
Chromium	0.01455	0.25								J
Cobalt	0.0207	0.25								J
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								
Thallium	ND	0.25								

LCS Sample ID: **LCS-109160-109160** Units: **mg/Kg** Analysis Date: **10/17/2017 07:58 P**
Client ID: Run ID: **ICPMS3_171017A** SeqNo: **4706775** Prep Date: **10/17/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.569	0.25	5	0	91.4	80-120	0			
Arsenic	4.716	0.25	5	0	94.3	80-120	0			
Barium	5.007	0.25	5	0	100	80-120	0			
Beryllium	4.615	0.10	5	0	92.3	80-120	0			
Boron	23.68	1.0	25	0	94.7	80-120	0			
Cadmium	4.847	0.10	5	0	96.9	80-120	0			
Chromium	4.869	0.25	5	0	97.4	80-120	0			
Cobalt	4.782	0.25	5	0	95.6	80-120	0			
Lead	5.026	0.25	5	0	101	80-120	0			
Lithium	4.817	0.50	5	0	96.3	80-120	0			
Molybdenum	5.086	0.25	5	0	102	80-120	0			
Selenium	4.74	0.25	5	0	94.8	80-120	0			
Thallium	4.975	0.25	5	0	99.5	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710955
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **109160** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1710819-03BMS** Units: **mg/Kg** Analysis Date: **10/17/2017 08:33 P**

Client ID: Run ID: **ICPMS3_171017A** SeqNo: **4706797** Prep Date: **10/17/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.718	0.41	8.104	0.07419	82	75-125	0			
Arsenic	7.489	0.41	8.104	0.6809	84	75-125	0			
Barium	15.04	0.41	8.104	7.104	97.9	75-125	0			
Beryllium	7.467	0.16	8.104	0.07125	91.3	75-125	0			
Boron	38.35	1.6	40.52	0.5986	93.2	75-125	0			
Cadmium	6.975	0.16	8.104	-0.01132	86.2	75-125	0			
Chromium	10.97	0.41	8.104	5.4	68.7	75-125	0			S
Cobalt	7.375	0.41	8.104	0.6472	83	75-125	0			
Lead	11.23	0.41	8.104	2.4	109	75-125	0			
Lithium	9.345	0.81	8.104	1.142	101	75-125	0			
Molybdenum	7.511	0.41	8.104	0.06914	91.8	75-125	0			
Selenium	7.371	0.41	8.104	0.6414	83	75-125	0			
Thallium	7.717	0.41	8.104	0.005456	95.2	75-125	0			

MSD Sample ID: **1710819-03BMSD** Units: **mg/Kg** Analysis Date: **10/17/2017 08:35 P**

Client ID: Run ID: **ICPMS3_171017A** SeqNo: **4706798** Prep Date: **10/17/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.696	0.41	8.13	0.07419	81.5	75-125	6.718	0.328	20	
Arsenic	7.433	0.41	8.13	0.6809	83	75-125	7.489	0.758	20	
Barium	14.8	0.41	8.13	7.104	94.6	75-125	15.04	1.62	20	
Beryllium	7.344	0.16	8.13	0.07125	89.4	75-125	7.467	1.66	20	
Boron	38.69	1.6	40.65	0.5986	93.7	75-125	38.35	0.899	20	
Cadmium	6.974	0.16	8.13	-0.01132	85.9	75-125	6.975	0.00818	20	
Chromium	10.82	0.41	8.13	5.4	66.6	75-125	10.97	1.42	20	S
Cobalt	7.404	0.41	8.13	0.6472	83.1	75-125	7.375	0.383	20	
Lead	9.544	0.41	8.13	2.4	87.9	75-125	11.23	16.2	20	
Lithium	9.208	0.81	8.13	1.142	99.2	75-125	9.345	1.48	20	
Molybdenum	7.599	0.41	8.13	0.06914	92.6	75-125	7.511	1.16	20	
Selenium	7.28	0.41	8.13	0.6414	81.7	75-125	7.371	1.24	20	
Thallium	7.77	0.41	8.13	0.005456	95.5	75-125	7.717	0.686	20	

The following samples were analyzed in this batch: 1710955-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710955
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **110236** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-110236-110236** Units: **mg/L** Analysis Date: **11/8/2017 04:29 PM**
Client ID: Run ID: **ICPMS3_171108A** SeqNo: **4749330** Prep Date: **11/8/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Selenium	ND	0.0050								

LCS Sample ID: **LCS-110236-110236** Units: **mg/L** Analysis Date: **11/8/2017 04:30 PM**
Client ID: Run ID: **ICPMS3_171108A** SeqNo: **4749331** Prep Date: **11/8/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09673	0.0050	0.1	0	96.7	80-120	0			
Barium	0.09771	0.0050	0.1	0	97.7	80-120	0			
Selenium	0.09543	0.0050	0.1	0	95.4	80-120	0			

MS Sample ID: **1711348-01CMS** Units: **mg/L** Analysis Date: **11/8/2017 05:05 PM**
Client ID: Run ID: **ICPMS3_171108A** SeqNo: **4749353** Prep Date: **11/8/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09858	0.0050	0.1	0.003213	95.4	75-125	0			
Barium	0.1695	0.0050	0.1	0.07082	98.7	75-125	0			
Selenium	0.09192	0.0050	0.1	0.000434	91.5	75-125	0			

MSD Sample ID: **1711348-01CMSD** Units: **mg/L** Analysis Date: **11/8/2017 05:07 PM**
Client ID: Run ID: **ICPMS3_171108A** SeqNo: **4749354** Prep Date: **11/8/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1004	0.0050	0.1	0.003213	97.2	75-125	0.09858	1.87	20	
Barium	0.1771	0.0050	0.1	0.07082	106	75-125	0.1695	4.4	20	
Selenium	0.1016	0.0050	0.1	0.000434	101	75-125	0.09192	9.98	20	

The following samples were analyzed in this batch: 1710955-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710955
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **109369** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-109369-109369** Units: **mg/Kg** Analysis Date: **10/20/2017 09:42 A**
Client ID: Run ID: **IC4_171020A** SeqNo: **4712788** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	10								
Fluoride	ND	1.0								
Sulfate	ND	10								

LCS Sample ID: **LCS-109369-109369** Units: **mg/Kg** Analysis Date: **10/20/2017 10:01 A**
Client ID: Run ID: **IC4_171020A** SeqNo: **4712789** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	91.37	10	100	0	91.4	80-120	0			
Fluoride	19.16	1.0	20	0	95.8	80-120	0			
Sulfate	95.78	10	100	0	95.8	80-120	0			

MS Sample ID: **1710867-21A MS** Units: **mg/Kg** Analysis Date: **10/20/2017 10:40 A**
Client ID: Run ID: **IC4_171020A** SeqNo: **4712791** Prep Date: **10/19/2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	694.1	49	97.47	642	53.4	75-125	0			SO
Fluoride	17	4.9	19.49	0	87.2	75-125	0			
Sulfate	99.8	49	97.47	20.27	81.6	75-125	0			

MSD Sample ID: **1710867-21A MSD** Units: **mg/Kg** Analysis Date: **10/20/2017 10:59 A**
Client ID: Run ID: **IC4_171020A** SeqNo: **4712792** Prep Date: **10/19/2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	699.5	49	97.47	642	59	75-125	694.1	0.774	20	SO
Fluoride	16.58	4.9	19.49	0	85	75-125	17	2.5	20	
Sulfate	20.65	49	97.47	20.27	0.397	75-125	99.8	0	20	JS

The following samples were analyzed in this batch: 1710955-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710955
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **R222403** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R222403** Units: **% of sample** Analysis Date: **10/16/2017 05:05 P**
Client ID: Run ID: **MOIST_171016C** SeqNo: **4703913** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R222403** Units: **% of sample** Analysis Date: **10/16/2017 05:05 P**
Client ID: Run ID: **MOIST_171016C** SeqNo: **4703912** 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: **17101027-04A DUP** Units: **% of sample** Analysis Date: **10/16/2017 05:05 P**
Client ID: Run ID: **MOIST_171016C** SeqNo: **4703909** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.8	0.050	0	0	0	0-0	15.19	2.6	5	

DUP Sample ID: **1710955-01A DUP** Units: **% of sample** Analysis Date: **10/16/2017 05:05 P**
Client ID: **196** Run ID: **MOIST_171016C** SeqNo: **4703911** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	41.97	0.050	0	0	0	0-0	40.85	2.7	5	

The following samples were analyzed in this batch: 1710955-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 37817

ALS Project Manager: | ALS Work Order #: 1710955

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	JDY CYAP	A	Metals (listed)
Work Order		Project Number	133-17-001	B	Sulfate, Chloride, Fluoride
Company Name	E+E Solutions	Bill To Company	Holland BPW	C	Radium 226 + 228 combined
Send Report To	Blaine. Litteral	Invoice Attn	Judy Visscher	D	
Address	400 E 136th 100 B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	blaine.litteral@goEEsolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	196	10/13	1:30	Clay		1	X	X	X								
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Mitch Stark

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

	Date:	Time:	
Relinquished by:	10/13	3:23	Received by:
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory): KR	Date: 10/13/17	Time: 1606	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	4.8 °C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **13-Oct-17 15:23**

Work Order: **1710955** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 13-Oct-17 (Date) Reviewed by: Bill Carey (eSignature) 16-Oct-17 (Date)

Matrices: Soil

Carrier name: Client

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):	4.8/4.8 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/13/2017 4:02:30 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:

Friday, November 03, 2017

Bill Carey
ALS Environmental
3352 128th Avenue
Holland, MI 49424

Re: ALS Workorder: 1710366
Project Name:
Project Number: 1710955

Dear Mr. Carey:

One solid sample was received from ALS Environmental, on 10/18/2017. The sample was scheduled for the following analysis:

Gamma Spectroscopy

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

[redacted]

Jeff R. Kujawa
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1710366

Gamma Spectroscopy:

The sample was analyzed for the presence of gamma emitting radionuclides according to HASL 300 Ga-01.

All acceptance criteria were met, with the following exception:

Radium-226 quantification based on the 186.21 keV photon suffers from interference with the 185.72 keV photon emitted by ^{235}U. Due to the high abundance of this photon in ^{235}U emissions, even small amounts of ^{235}U may bias the ^{226}Ra results high. Thus, any measured activity for ^{226}Ra has been flagged with an "SI" qualifier, denoting spectral interference.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1710366
Client Name: ALS Environmental
Client Project Name:
Client Project Number: 1710955
Client PO Number: 20-1710955

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
196	1710366-1		SOLID	13-Oct-17	13:30

1710366

ALS Environmental

Subcontractor:
ALS Environmental, Fort Collins
225 Commerce Dr.
Fort Collins, CO 80524
TEL: (800) 443-1511
FAX:
Acct #:

CHAIN-OF-CUSTODY RECORD

Date: 17-Oct-17
COC ID: 8138
Due D 18-Oct-17

Salesperson	ALSHN Account

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	1710955	A	Subcontracted Analyses (SUBCONTRACT)
Work Order		Project Number		B	
Company Name	ALS Group USA, Corp	Bill To Company	ALS Group USA, Corp	C	
Send Report To	Bill Carey	Inv Attn	Accounts Payable	D	
Address	3352 128th Ave	Address	3352 128th Ave	E	
				F	
City/State/Zip	Holland, Michigan 49424	City/State/Zip	Holland, Michigan 49424	G	
Phone	(616) 399-6070	Phone	(616) 399-6070	H	
Fax	(616) 399-6185	Fax	(616) 399-6185	I	
eMail Address	bill.carey@alsglobal.com	eMail CC		J	

	ALS Sample ID	Client Sample ID	Matrix	Collection Date 24hr	Bottle	A	B	C	D	E	F	G	H	I	J
1	1710955-01A	196	Solid	13/Oct/2017 13:30	(1) 4OZGNEAT	X									

Comments:
Please analyze enclosed samples for Radium 226 and Radium 228. Thank you.

Relinquished by:	Date/Time	Received by:	Date/Time	Cooler IDs	Report/QC Level
					Std
Relinquished by:	Date/Time	Received by:	Date/Time		

10.18.17 0905

5210

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS MI Workorder No: 1710366

Project Manager: JK Initials: VA Date: 10.18.17

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	(N/A)	YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?	VA 10.18	(YES)	(NO)
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	(N/A)	YES	NO
16. Were the samples shipped on ice?		YES	(NO)
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	RAD ONLY	YES	(NO)

Cooler #:	1							
Temperature (°C):	NMB							
No. of custody seals on cooler:	0							
DOT Survey/ Acceptance Information External µR/hr reading:	11							
Background µR/hr reading:	10							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

-SAMPLE JAR IS ONLY ABOUT 1/5TH FULL

If applicable, was the client contacted? **YES / NO / (NA)** Contact: _____ Date/Time: _____

Project Manager Signature / Date: [signature] 10.18.17

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Ref:
Dep:

Date: 17Oct17
Wgt: 3.45 LBS

DV:

SHIPPING: 25.2
SPECIAL: 1.0
HANDLING: 0.0
0.00 TOTAL: 26.3

Svcs: STANDARD OVERNIGHT
TRCK: 7261 2422 4447

ORIGIN ID:GRRA (616) 399-6070
SAMPLE RECEIVING
ALS ENVIRONMENTAL
3352 128TH AVENUE

HOLLAND, MI 494249263
UNITED STATES US

SHIP DATE: 17OCT17
ACTWGT: 3.45 LB
CAD: 0122071/CAFE3108

BILL SENDER

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
225 COMMERCE DR

FORT COLLINS CO 80524

(970) 490-1511

REF:
INV:
PO:
DEPT:

FedEx Express

TRK# 0201 7261 2422 4447

WED - 18 OCT 3:00P
STANDARD OVERNIGHT

NA FTCA

80524
CO-US DEN

Client:	ALS Environmental	**Date:**	*03-Nov-17*
Project:	1710955	**Work Order:**	1710366
Sample ID:	196	**Lab ID:**	1710366-1
Legal Location:		**Matrix:**	SOLID
Collection Date:	10/13/2017 13:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**		Prep Date: **10/24/2017**	PrepBy: **MRL**	
Ra-226	ND (+/- 5.3)	U,G,SI	10.4	pCi/g	NA	10/31/2017 10:18
Ra-228	ND (+/- 1.2)	U,G	2	pCi/g	NA	10/31/2017 10:18

Client:	ALS Environmental	**Date:**	*03-Nov-17*
Project:	1710955	**Work Order:**	1710366
Sample ID:	196	**Lab ID:**	1710366-1
Legal Location:		**Matrix:**	SOLID
Collection Date:	10/13/2017 13:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

QC BATCH REPORT

Batch ID: **GS171024-2-2** Instrument ID: **GAMMA** Method: **Gamma Spectroscopy Results**

LCS Sample ID: **GS171024-2** Units: **pCi/g** Analysis Date: **10/31/2017 11:07**

Client ID: Run ID: **GS171024-2A** Prep Date: **10/24/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Am-241	990 (+/- 120)	20	995.2		99.6	85-115					P
Co-60	394 (+/- 46)	1	392.9		100	85-115					P
Cs-137	377 (+/- 44)	2	374.1		101	85-115					P,M3

MB Sample ID: **GS171024-2A** Units: **pCi/g** Analysis Date: **10/31/2017 10:54**

Client ID: Run ID: **GS171024-2A** Prep Date: **10/24/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Am-241	ND	0.54									U
Co-60	ND	0.129									U
Cs-137	ND	0.119									U
Ra-226	ND	1.75									U,SI
Ra-228	ND	0.56									U

The following samples were analyzed in this batch: 1710366-1

12-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **1711448**

Dear Blaine,

ALS Environmental received 1 sample on 07-Nov-2017 01:30 PM 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 industry accepted practices and Quality Control 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 11.

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

Report of Laboratory Analysis

ALS Group, USA

Date: 12-Nov-17

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **1711448**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1711448-01	4084	Solid		11/7/2017 12:50	11/7/2017 13:30	☐

ALS Group, USA

Date: 12-Nov-17

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **1711448**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *12-Nov-17*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1711448
Sample ID: 4084
Lab ID: 1711448-01
Collection Date: 11/7/2017 12:50 PM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/9/17 14:35		Analyst: **RSH**
Mercury	**0.022**		**0.021**	**mg/Kg-dry**	1	11/9/2017 04:14 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/9/17 11:13		Analyst: **JF**
Antimony	ND		0.13	mg/Kg-dry	1	11/9/2017 01:17 PM
Arsenic	**3.3**		**0.052**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Barium	**24**		**0.43**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Beryllium	**0.19**		**0.17**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Boron	**5.3**		**1.7**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Cadmium	ND		0.087	mg/Kg-dry	1	11/9/2017 01:17 PM
Chromium	**5.4**		**0.43**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Cobalt	**3.2**		**0.22**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Lead	**6.2**		**0.43**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Lithium	**6.2**		**0.17**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Molybdenum	ND		0.43	mg/Kg-dry	1	11/9/2017 01:17 PM
Selenium	**1.2**		**0.087**	**mg/Kg-dry**	1	11/9/2017 01:17 PM
Thallium	ND		0.22	mg/Kg-dry	1	11/9/2017 01:17 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/9/17 10:30		Analyst: **EE**
Chloride	**67**		**13**	**mg/Kg-dry**	1	11/9/2017 11:15 AM
Fluoride	ND		1.3	mg/Kg-dry	1	11/9/2017 11:15 AM
Sulfate	**520**		**64**	**mg/Kg-dry**	5	11/9/2017 11:34 AM
MOISTURE			**SW3550C**			Analyst: **RZM**
Moisture	**23**		**0.050**	**% of sample**	1	11/8/2017 05:05 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **110335** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-110335-110335**				Units: **mg/Kg**			Analysis Date: **11/9/2017 03:30 PM**			
Client ID:	Run ID: **HG1_171109A**				SeqNo: **4751128**			Prep Date: **11/9/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	ND	0.020									

LCS	Sample ID: **LCS-110335-110335**				Units: **mg/Kg**			Analysis Date: **11/9/2017 03:32 PM**			
Client ID:	Run ID: **HG1_171109A**				SeqNo: **4751129**			Prep Date: **11/9/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.16	0.020	0.1665	0	96.1	80-120	0				

MS	Sample ID: **1711232-02AMS**				Units: **mg/Kg**			Analysis Date: **11/9/2017 04:09 PM**			
Client ID:	Run ID: **HG1_171109A**				SeqNo: **4751143**			Prep Date: **11/9/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1613	0.017	0.1401	0.009384	108	75-125	0				

MSD	Sample ID: **1711232-02AMSD**				Units: **mg/Kg**			Analysis Date: **11/9/2017 04:12 PM**			
Client ID:	Run ID: **HG1_171109A**				SeqNo: **4751144**			Prep Date: **11/9/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1592	0.017	0.1395	0.009384	107	75-125	0.1613	1.29	35		

The following samples were analyzed in this batch: 1711448-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711448
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **110314** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-110314-110314** Units: **mg/Kg** Analysis Date: **11/9/2017 01:14 PM**
Client ID: Run ID: **ICPMS3_171109A** SeqNo: **4750792** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.25								
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.128	1.0								J
Cadmium	ND	0.10								
Chromium	0.06355	0.25								J
Cobalt	ND	0.25								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								
Thallium	ND	0.25								

LCS Sample ID: **LCS-110314-110314** Units: **mg/Kg** Analysis Date: **11/9/2017 01:15 PM**
Client ID: Run ID: **ICPMS3_171109A** SeqNo: **4750793** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	5.06	0.25	5	0	101	80-120	0			
Arsenic	4.998	0.25	5	0	100	80-120	0			
Barium	5.21	0.25	5	0	104	80-120	0			
Beryllium	4.779	0.10	5	0	95.6	80-120	0			
Boron	23.8	1.0	25	0	95.2	80-120	0			
Cadmium	5.03	0.10	5	0	101	80-120	0			
Chromium	5.085	0.25	5	0	102	80-120	0			
Cobalt	5.121	0.25	5	0	102	80-120	0			
Lead	5.053	0.25	5	0	101	80-120	0			
Lithium	4.93	0.50	5	0	98.6	80-120	0			
Molybdenum	5.161	0.25	5	0	103	80-120	0			
Selenium	5	0.25	5	0	100	80-120	0			
Thallium	5.066	0.25	5	0	101	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711448
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **110314** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1711571-02AMS** Units: **mg/Kg** Analysis Date: **11/9/2017 01:26 PM**
Client ID: Run ID: **ICPMS3_171109A** SeqNo: **4750800** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.709	0.36	7.205	0.02095	92.8	75-125	0			
Arsenic	10.01	0.36	7.205	3.525	90	75-125	0			
Barium	13.97	0.36	7.205	5.976	111	75-125	0			
Beryllium	7.167	0.14	7.205	0.1124	97.9	75-125	0			
Boron	36.65	1.4	36.02	1.656	97.1	75-125	0			
Cadmium	6.804	0.14	7.205	0.09935	93.1	75-125	0			
Chromium	9.244	0.36	7.205	1.742	104	75-125	0			
Cobalt	7.665	0.36	7.205	0.9803	92.8	75-125	0			
Lead	8.161	0.36	7.205	1.123	97.7	75-125	0			
Lithium	11.65	0.72	7.205	3.814	109	75-125	0			
Molybdenum	7.839	0.36	7.205	0.9657	95.4	75-125	0			
Selenium	7.268	0.36	7.205	0.4803	94.2	75-125	0			
Thallium	7.231	0.36	7.205	0.02522	100	75-125	0			

MSD Sample ID: **1711571-02AMSD** Units: **mg/Kg** Analysis Date: **11/9/2017 01:28 PM**
Client ID: Run ID: **ICPMS3_171109A** SeqNo: **4750801** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.737	0.36	7.225	0.02095	92.9	75-125	6.709	0.403	20	
Arsenic	10.71	0.36	7.225	3.525	99.4	75-125	10.01	6.71	20	
Barium	16.12	0.36	7.225	5.976	140	75-125	13.97	14.3	20	S
Beryllium	7.021	0.14	7.225	0.1124	95.6	75-125	7.167	2.06	20	
Boron	36.41	1.4	36.13	1.656	96.2	75-125	36.65	0.659	20	
Cadmium	6.794	0.14	7.225	0.09935	92.6	75-125	6.804	0.153	20	
Chromium	8.877	0.36	7.225	1.742	98.7	75-125	9.244	4.05	20	
Cobalt	7.767	0.36	7.225	0.9803	93.9	75-125	7.665	1.32	20	
Lead	8.471	0.36	7.225	1.123	102	75-125	8.161	3.72	20	
Lithium	12.02	0.72	7.225	3.814	114	75-125	11.65	3.08	20	
Molybdenum	8.169	0.36	7.225	0.9657	99.7	75-125	7.839	4.12	20	
Selenium	7.075	0.36	7.225	0.4803	91.3	75-125	7.268	2.68	20	
Thallium	7.282	0.36	7.225	0.02522	100	75-125	7.231	0.692	20	

The following samples were analyzed in this batch: 1711448-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711448
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **110361** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-110361-110361** Units: **mg/Kg** Analysis Date: **11/9/2017 10:55 AM**
Client ID: Run ID: **IC4_171109A** SeqNo: **4751111** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	10								
Fluoride	ND	1.0								
Sulfate	ND	10								

LCS Sample ID: **LCS-110361-110361** Units: **mg/Kg** Analysis Date: **11/9/2017 10:34 AM**
Client ID: Run ID: **IC4_171109A** SeqNo: **4751110** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	90.89	10	100	0	90.9	80-120	0			
Fluoride	19.41	1.0	20	0	97	80-120	0			
Sulfate	94.55	10	100	0	94.6	80-120	0			

MS Sample ID: **1711448-01A MS** Units: **mg/Kg** Analysis Date: **11/9/2017 11:53 AM**
Client ID: **4084** Run ID: **IC4_171109A** SeqNo: **4751114** Prep Date: **11/9/2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	142.1	49	98.62	62.82	80.4	75-125	0			
Fluoride	14.04	4.9	19.72	0	71.2	75-125	0			S
Sulfate	462.9	49	98.62	396.8	67	75-125	0			SO

MSD Sample ID: **1711448-01A MSD** Units: **mg/Kg** Analysis Date: **11/9/2017 12:12 PM**
Client ID: **4084** Run ID: **IC4_171109A** SeqNo: **4751115** Prep Date: **11/9/2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	132.2	49	97.28	62.82	71.4	75-125	142.1	7.2	20	S
Fluoride	13.88	4.9	19.46	0	71.4	75-125	14.04	1.13	20	S
Sulfate	460.1	49	97.28	396.8	65	75-125	462.9	0.611	20	SO

The following samples were analyzed in this batch: 1711448-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711448
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R224169** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R224169** Units: **% of sample** Analysis Date: **11/8/2017 05:05 PM**
Client ID: Run ID: **MOIST_171108D** SeqNo: **4749758** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R224169** Units: **% of sample** Analysis Date: **11/8/2017 05:05 PM**
Client ID: Run ID: **MOIST_171108D** SeqNo: **4749756** 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: **1711448-01A DUP** Units: **% of sample** Analysis Date: **11/8/2017 05:05 PM**
Client ID: **4084** Run ID: **MOIST_171108D** SeqNo: **4749754** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	23.58	0.050	0	0	0	0-0	23.35	0.98	5	

The following samples were analyzed in this batch: 1711448-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 38872

ALS Project Manager: | ALS Work Order #: 1711946

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CYAP	A	metals (listed)
Work Order		Project Number	133-17-001	B	
Company Name	Engineering Environmental Services	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn		D	
Address	400 136th Ave Bldg 100 suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	(616) 931-3967	Phone		H	
Fax	(616) 931-3970	Fax		I	
e-Mail Address	blaine.litteral@geesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4084	11/7	12:50p	Sand		1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell	11/7	1:30	Nicole Fuller
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory): NTF	Date: 11-7-17	Time: 1340	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SP2	4.8

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **07-Nov-17 13:30**

Work Order: **1711448** Received by: **NCF**

Checklist completed by Nicole Fredericks (eSignature) 07-Nov-17 (Date) Reviewed by: Chad Whelton (eSignature) 08-Nov-17 (Date)

Matrices: Water
Carrier name: Client

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):	4.8/4.8	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/7/20171:43:03 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:

15-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **JDY CYAP 133-17-001** Work Order: **1710669**

Dear Blaine,

ALS Environmental received 5 samples on 10-Oct-2017 04:35 PM 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 industry accepted practices and Quality Control 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 35.

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

ALS Group, USA

Date: 15-Nov-17

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001
Work Order: **1710669**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1710669-01	4144	Solid		10/10/2017 15:43	10/10/2017 16:35	☐
1710669-02	4128	Solid		10/10/2017 15:46	10/10/2017 16:35	☐
1710669-03	4157	Solid		10/10/2017 15:50	10/10/2017 16:35	☐
1710669-04	4140	Solid		10/10/2017 15:52	10/10/2017 16:35	☐
1710669-05	4126	Solid		10/10/2017 15:55	10/10/2017 16:35	☐

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001
WorkOrder: **1710669**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
as noted	
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

ALS Group, USA

Date: *15-Nov-17*

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710669
Sample ID: 4144 **Lab ID:** 1710669-01
Collection Date: 10/10/2017 03:43 PM **Matrix:** SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/12/17 15:19		Analyst: **RSH**
Mercury	**0.026**		**0.021**	**mg/Kg-dry**	1	10/12/2017 03:23 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/11/17 13:54		Analyst: **JF**
Antimony	ND		0.13	mg/Kg-dry	1	10/11/2017 11:01 PM
Arsenic	**2.9**		**0.053**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Barium	**24**		**0.44**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Beryllium	**0.59**		**0.18**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Boron	**4.3**		**1.8**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Cadmium	**0.47**		**0.088**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Chromium	**4.1**		**0.44**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Cobalt	**5.2**		**0.22**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Lead	**3.9**		**0.44**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Lithium	**11**		**0.18**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Molybdenum	**0.59**		**0.44**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Selenium	**1.0**		**0.088**	**mg/Kg-dry**	1	10/11/2017 11:01 PM
Thallium	ND		0.22	mg/Kg-dry	1	10/11/2017 11:01 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/14/17 16:00		Analyst: **EE**
Chloride	**15**		**12**	**mg/Kg-dry**	1	10/17/2017 04:28 AM
Fluoride	**1.3**		**1.2**	**mg/Kg-dry**	1	10/17/2017 04:28 AM
Sulfate	**340**		**24**	**mg/Kg-dry**	2	10/17/2017 10:24 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**17**		**0.050**	**% of sample**	1	10/11/2017 02:00 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	11/7/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710669
Sample ID: 4128 **Lab ID:** 1710669-02
Collection Date: 10/10/2017 03:46 PM **Matrix:** SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/12/17 15:19		Analyst: **RSH**
Mercury	ND		0.017	mg/Kg-dry	1	10/12/2017 03:26 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/11/17 13:54		Analyst: **JF**
Antimony	ND		0.12	mg/Kg-dry	1	10/11/2017 11:07 PM
Arsenic	**2.8**		**0.049**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Barium	**13**		**0.41**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Beryllium	**0.82**		**0.16**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Boron	**3.6**		**1.6**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Cadmium	**0.56**		**0.082**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Chromium	**2.9**		**0.41**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Cobalt	**7.6**		**0.20**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Lead	**4.1**		**0.41**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Lithium	**5.5**		**0.16**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Molybdenum	ND		0.41	mg/Kg-dry	1	10/11/2017 11:07 PM
Selenium	**1.2**		**0.082**	**mg/Kg-dry**	1	10/11/2017 11:07 PM
Thallium	ND		0.20	mg/Kg-dry	1	10/11/2017 11:07 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/14/17 16:00		Analyst: **EE**
Chloride	ND		11	mg/Kg-dry	1	10/17/2017 05:26 AM
Fluoride	ND		1.1	mg/Kg-dry	1	10/17/2017 05:26 AM
Sulfate	**2,900**		**220**	**mg/Kg-dry**	20	10/17/2017 10:43 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**8.6**		**0.050**	**% of sample**	1	10/11/2017 02:00 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	11/7/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710669
Sample ID: 4157 **Lab ID:** 1710669-03
Collection Date: 10/10/2017 03:50 PM **Matrix:** SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/12/17 15:19		Analyst: **RSH**
Mercury	**0.21**		**0.021**	**mg/Kg-dry**	1	10/12/2017 03:28 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/11/17 13:54		Analyst: **JF**
Antimony	**0.61**		**0.14**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Arsenic	**5.3**		**0.054**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Barium	**43**		**0.45**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Beryllium	**0.24**		**0.18**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Boron	**6.6**		**1.8**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Cadmium	**0.49**		**0.090**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Chromium	**11**		**0.45**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Cobalt	**3.1**		**0.23**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Lead	**27**		**0.45**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Lithium	**4.7**		**0.18**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Molybdenum	**2.3**		**0.45**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Selenium	**1.1**		**0.090**	**mg/Kg-dry**	1	10/11/2017 11:09 PM
Thallium	ND		0.23	mg/Kg-dry	1	10/11/2017 11:09 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/14/17 16:00		Analyst: **EE**
Chloride	**130**		**12**	**mg/Kg-dry**	1	10/17/2017 06:04 AM
Fluoride	**2.6**		**1.2**	**mg/Kg-dry**	1	10/17/2017 06:04 AM
Sulfate	**430**		**62**	**mg/Kg-dry**	5	10/17/2017 11:02 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**21**		**0.050**	**% of sample**	1	10/11/2017 02:00 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	11/7/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710669
Sample ID: 4140 **Lab ID:** 1710669-04
Collection Date: 10/10/2017 03:52 PM **Matrix:** SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/12/17 15:19		Analyst: **RSH**
Mercury	**0.057**		**0.021**	**mg/Kg-dry**	1	10/12/2017 03:36 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/11/17 13:54		Analyst: **JF**
Antimony	**0.50**		**0.13**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Arsenic	**11**		**0.051**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Barium	**50**		**0.43**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Beryllium	**1.1**		**0.17**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Boron	**8.4**		**1.7**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Cadmium	**0.24**		**0.086**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Chromium	**5.3**		**0.43**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Cobalt	**3.5**		**0.21**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Lead	**12**		**0.43**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Lithium	**12**		**0.17**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Molybdenum	**8.3**		**0.43**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Selenium	**2.7**		**0.086**	**mg/Kg-dry**	1	10/11/2017 11:10 PM
Thallium	ND		0.21	mg/Kg-dry	1	10/11/2017 11:10 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 10/19/17 13:33		Analyst: **JF**
Lithium	**0.012**		**0.010**	**mg/L**	1	10/20/2017 02:10 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/14/17 16:00		Analyst: **EE**
Chloride	**47**		**12**	**mg/Kg-dry**	1	10/17/2017 06:23 AM
Fluoride	**2.9**		**1.2**	**mg/Kg-dry**	1	10/17/2017 06:23 AM
Sulfate	**780**		**59**	**mg/Kg-dry**	5	10/17/2017 06:42 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**16**		**0.050**	**% of sample**	1	10/11/2017 02:00 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	11/7/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *15-Nov-17*

Client: Engineering & Environmental Solutions
Project: JDY CYAP 133-17-001 **Work Order:** 1710669
Sample ID: 4126 **Lab ID:** 1710669-05
Collection Date: 10/10/2017 03:55 PM **Matrix:** SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/12/17 15:19		Analyst: **RSH**
Mercury	**0.042**		**0.023**	**mg/Kg-dry**	1	10/12/2017 03:38 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/11/17 13:54		Analyst: **JF**
Antimony	**0.70**		**0.14**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Arsenic	**14**		**0.057**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Barium	**58**		**0.47**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Beryllium	**1.5**		**0.19**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Boron	**16**		**1.9**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Cadmium	**2.2**		**0.094**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Chromium	**10**		**0.47**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Cobalt	**4.3**		**0.24**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Lead	**9.7**		**0.47**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Lithium	**9.0**		**0.19**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Molybdenum	**2.2**		**0.47**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Selenium	**3.3**		**0.094**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
Thallium	**0.35**		**0.24**	**mg/Kg-dry**	1	10/11/2017 11:12 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 10/19/17 13:33		Analyst: **JF**
Arsenic	ND		0.0050	mg/L	1	10/20/2017 02:17 PM
Selenium	ND		0.0050	mg/L	1	10/20/2017 02:17 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/14/17 16:00		Analyst: **EE**
Chloride	**37**		**26**	**mg/Kg-dry**	2	10/17/2017 07:02 AM
Fluoride	ND		2.6	mg/Kg-dry	2	10/17/2017 07:02 AM
Sulfate	**3,600**		**260**	**mg/Kg-dry**	20	10/17/2017 07:21 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**25**		**0.050**	**% of sample**	1	10/11/2017 02:00 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	11/7/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **108947** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-108947-108947**			Units: **mg/Kg**			Analysis Date: **10/12/2017 03:18 P**			
Client ID:	Run ID: **HG1_171012B**			SeqNo: **4695629**			Prep Date: **10/12/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-108947-108947**			Units: **mg/Kg**			Analysis Date: **10/12/2017 03:20 P**			
Client ID:	Run ID: **HG1_171012B**			SeqNo: **4695630**			Prep Date: **10/12/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1517	0.020	0.1665	0	91.1	80-120	0			

MS	Sample ID: **1710669-03AMS**			Units: **mg/Kg**			Analysis Date: **10/12/2017 03:31 P**			
Client ID: **4157**	Run ID: **HG1_171012B**			SeqNo: **4695634**			Prep Date: **10/12/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.6166	0.016	0.1323	0.1658	341	75-125	0			SE

MSD	Sample ID: **1710669-03AMSD**			Units: **mg/Kg**			Analysis Date: **10/12/2017 03:33 P**			
Client ID: **4157**	Run ID: **HG1_171012B**			SeqNo: **4695635**			Prep Date: **10/12/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.4398	0.016	0.1336	0.1658	205	75-125	0.6166	33.5	35	SE

The following samples were analyzed in this batch:

1710669-01A	1710669-02A	1710669-03A
1710669-04A	1710669-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710669
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **108847** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-108847-108847** Units: **mg/Kg** Analysis Date: **10/11/2017 09:59 P**
Client ID: Run ID: **ICPMS3_171011A** SeqNo: **4693838** Prep Date: **10/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.00845	0.25	0	0	0	0-0	0			J
Arsenic	ND	0.25	0	0	0	0-0	0			
Barium	0.07055	0.25	0	0	0	0-0	0			J
Beryllium	0.0095	0.10	0	0	0	0-0	0			J
Cadmium	0.00635	0.10	0	0	0	0-0	0			J
Chromium	0.03485	0.25	0	0	0	0-0	0			J
Lead	0.0172	0.25	0	0	0	0-0	0			J
Lithium	ND	0.50	0	0	0		0			
Molybdenum	0.0102	0.25	0	0	0	0-0	0			J
Selenium	ND	0.25	0	0	0	0-0	0			
Thallium	0.00815	0.25	0	0	0	0-0	0			J

MBLK Sample ID: **MBLK-108847-108847** Units: **mg/Kg** Analysis Date: **10/12/2017 02:46 P**
Client ID: Run ID: **ICPMS3_171012A** SeqNo: **4695525** Prep Date: **10/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Boron	0.1478	1.0								J

LCS Sample ID: **LCS-108847-108847** Units: **mg/Kg** Analysis Date: **10/11/2017 10:05 P**
Client ID: Run ID: **ICPMS3_171011A** SeqNo: **4693842** Prep Date: **10/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.808	0.25	5	0	96.2	80-120	0			
Arsenic	4.949	0.25	5	0	99	80-120	0			
Barium	5.084	0.25	5	0	102	80-120	0			
Cadmium	4.916	0.10	5	0	98.3	80-120	0			
Chromium	5.007	0.25	5	0	100	80-120	0			
Lead	4.984	0.25	5	0	99.7	80-120	0			
Lithium	5.036	0.50	5	0	101	80-120	0			
Molybdenum	5.096	0.25	5	0	102	80-120	0			
Selenium	4.685	0.25	5	0	93.7	80-120	0			
Thallium	4.949	0.25	5	0	99	80-120	0			

LCS Sample ID: **LCS-108847-108847** Units: **mg/Kg** Analysis Date: **10/12/2017 02:47 P**
Client ID: Run ID: **ICPMS3_171012A** SeqNo: **4695526** Prep Date: **10/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	5.054	0.10	5	0	101	80-120	0			
Boron	25.19	1.0	25	0	101	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710669
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **108847** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1710517-06BMS** Units: **mg/Kg** Analysis Date: **10/11/2017 10:17 P**
Client ID: Run ID: **ICPMS3_171011A** SeqNo: **4693849** Prep Date: **10/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.779	0.37	7.364	0.0825	90.9	75-125	0			
Arsenic	7.959	0.37	7.364	1.082	93.4	75-125	0			
Barium	15.57	0.37	7.364	7.779	106	75-125	0			
Cadmium	6.87	0.15	7.364	-0.01654	93.5	75-125	0			
Chromium	10.07	0.37	7.364	2.739	99.5	75-125	0			
Lead	10.48	0.37	7.364	3.183	99.1	75-125	0			
Lithium	9.285	0.74	7.364	1.449	106	75-125	0			
Molybdenum	7.6	0.37	7.364	0.2468	99.9	75-125	0			
Selenium	6.966	0.37	7.364	0.3144	90.3	75-125	0			
Thallium	7.361	0.37	7.364	0.0364	99.5	75-125	0			

MS Sample ID: **1710517-06BMS** Units: **mg/Kg** Analysis Date: **10/12/2017 02:56 P**
Client ID: Run ID: **ICPMS3_171012A** SeqNo: **4695532** Prep Date: **10/11/2017** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.323	1.5	7.364	0.07993	98.4	75-125	0			
Boron	39.2	15	36.82	2.443	99.8	75-125	0			

MSD Sample ID: **1710517-06BMSD** Units: **mg/Kg** Analysis Date: **10/11/2017 10:18 P**
Client ID: Run ID: **ICPMS3_171011A** SeqNo: **4693850** Prep Date: **10/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.731	0.37	7.386	0.0825	90	75-125	6.779	0.712	20	
Arsenic	7.873	0.37	7.386	1.082	91.9	75-125	7.959	1.09	20	
Barium	15.93	0.37	7.386	7.779	110	75-125	15.57	2.29	20	
Cadmium	6.831	0.15	7.386	-0.01654	92.7	75-125	6.87	0.562	20	
Chromium	10.05	0.37	7.386	2.739	99	75-125	10.07	0.182	20	
Lead	10.54	0.37	7.386	3.183	99.6	75-125	10.48	0.555	20	
Lithium	9.67	0.74	7.386	1.449	111	75-125	9.285	4.06	20	
Molybdenum	7.399	0.37	7.386	0.2468	96.8	75-125	7.6	2.68	20	
Selenium	6.984	0.37	7.386	0.3144	90.3	75-125	6.966	0.257	20	
Thallium	7.248	0.37	7.386	0.0364	97.6	75-125	7.361	1.54	20	

MSD Sample ID: **1710517-06BMSD** Units: **mg/Kg** Analysis Date: **10/12/2017 02:58 P**
Client ID: Run ID: **ICPMS3_171012A** SeqNo: **4695533** Prep Date: **10/11/2017** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.297	1.5	7.386	0.07993	97.7	75-125	7.323	0.359	20	
Boron	38.63	15	36.93	2.443	98	75-125	39.2	1.47	20	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710669
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **108847** Instrument ID **ICPMS3** Method: **SW6020A**

The following samples were analyzed in this batch:

1710669-01A	1710669-02A	1710669-03A
1710669-04A	1710669-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710669
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **109279** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-109279-109279** Units: **mg/L** Analysis Date: **10/19/2017 01:12 P**
Client ID: Run ID: **ICPMS3_171019A** SeqNo: **4710320** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.0050								
Lithium	ND	0.010								
Selenium	ND	0.0050								

LCS Sample ID: **LCS-109279-109279** Units: **mg/L** Analysis Date: **10/19/2017 01:18 P**
Client ID: Run ID: **ICPMS3_171019A** SeqNo: **4710324** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09599	0.0050	0.1	0	96	80-120	0			
Lithium	0.09574	0.010	0.1	0	95.7	80-120	0			
Selenium	0.09398	0.0050	0.1	0	94	80-120	0			

MS Sample ID: **17101146-02BMS** Units: **mg/L** Analysis Date: **10/19/2017 01:21 P**
Client ID: Run ID: **ICPMS3_171019A** SeqNo: **4710326** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1023	0.0050	0.1	0.006867	95.4	75-125	0			
Lithium	0.1155	0.010	0.1	0.01523	100	75-125	0			
Selenium	0.09506	0.0050	0.1	0.002834	92.2	75-125	0			

MSD Sample ID: **17101146-02BMSD** Units: **mg/L** Analysis Date: **10/19/2017 01:23 P**
Client ID: Run ID: **ICPMS3_171019A** SeqNo: **4710327** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1021	0.0050	0.1	0.006867	95.2	75-125	0.1023	0.202	20	
Lithium	0.1144	0.010	0.1	0.01523	99.2	75-125	0.1155	0.905	20	
Selenium	0.09487	0.0050	0.1	0.002834	92	75-125	0.09506	0.201	20	

The following samples were analyzed in this batch: 1710669-04A 1710669-05A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710669
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **109147** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-109147-109147** Units: **mg/Kg** Analysis Date: **10/16/2017 09:46 P**
Client ID: Run ID: **IC3_171016B** SeqNo: **4704662** Prep Date: **10/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2.85	10								J
Fluoride	ND	1.0								
Sulfate	ND	10								

LCS Sample ID: **LCS-109147-109147** Units: **mg/Kg** Analysis Date: **10/16/2017 10:05 P**
Client ID: Run ID: **IC3_171016B** SeqNo: **4704663** Prep Date: **10/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	92.28	10	100	0	92.3	80-120	0			
Fluoride	19.89	1.0	20	0	99.4	80-120	0			
Sulfate	95.7	10	100	0	95.7	80-120	0			

MS Sample ID: **1710548-19A MS** Units: **mg/Kg** Analysis Date: **10/17/2017 02:33 A**
Client ID: Run ID: **IC3_171016B** SeqNo: **4704677** Prep Date: **10/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	92.05	9.8	98.04	6.763	87	75-125	0			
Fluoride	18.44	0.98	19.61	0	94.1	75-125	0			
Sulfate	101	9.8	98.04	9.502	93.3	75-125	0			

MSD Sample ID: **1710548-19A MSD** Units: **mg/Kg** Analysis Date: **10/17/2017 02:53 A**
Client ID: Run ID: **IC3_171016B** SeqNo: **4704678** Prep Date: **10/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	89.86	9.7	96.53	6.763	86.1	75-125	92.05	2.41	20	
Fluoride	17.62	0.97	19.31	0	91.3	75-125	18.44	4.58	20	
Sulfate	97.96	9.7	96.53	9.502	91.6	75-125	101	3.02	20	

The following samples were analyzed in this batch:

1710669-01A	1710669-02A	1710669-03A
1710669-04A	1710669-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1710669
Project: JDY CYAP 133-17-001

QC BATCH REPORT

Batch ID: **R222042** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R222042** Units: **% of sample** Analysis Date: **10/11/2017 02:00 P**
Client ID: Run ID: **MOIST_171011A** SeqNo: **4694145** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R222042** Units: **% of sample** Analysis Date: **10/11/2017 02:00 P**
Client ID: Run ID: **MOIST_171011A** SeqNo: **4694144** 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: **1710669-02A DUP** Units: **% of sample** Analysis Date: **10/11/2017 02:00 P**
Client ID: **4128** Run ID: **MOIST_171011A** SeqNo: **4694137** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	8.47	0.050	0	0	0	0-0	8.58	1.29	5	

DUP Sample ID: **1710669-05A DUP** Units: **% of sample** Analysis Date: **10/11/2017 02:00 P**
Client ID: **4126** Run ID: **MOIST_171011A** SeqNo: **4694141** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	23.15	0.050	0	0	0	0-0	25.09	8.04	5	R

The following samples were analyzed in this batch:

1710669-01A	1710669-02A	1710669-03A
1710669-04A	1710669-05A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

ALS Environmental

Chain of Custody Form

Page ____ of ____

COC ID: 37815

ALS Project Manager: | ALS Work Order #: 1710669

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	JDY CYAP	A	Metals (listed) + Radium
Work Order		Project Number	133-17-001	B	
Company Name	E & E Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	400 E 136th St 100 B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	blaine.litteral@goeesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4144	10/10	3:43	Sand			X										
2	4128		3:46				X										
3	4157		3:50				X										
4	4140		3:52				X										
5	4126		3:55				X										
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Mitch Stack

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☑ Other 2 DAY ☐ 2 BD ☐ 1 BD

Results Due Date:

Relinquished by:	Date: 10/10	Time:	Received by:	Notes:	
Relinquished by:	Date: 10/10/17	Time: 1635	Received by (Laboratory):	Cooler ID: SR2	Cooler Temp: 14.0°C
Logged by (Laboratory): Kew	Date: 10/10/17	Time: 1635	Checked by (Laboratory):		

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Bill Carey

From: Blaine Litteral <blaine.litteral@goeesolutions.net>
Sent: Monday, October 16, 2017 3:38 PM
To: Bill Carey
Subject: Re: 1710669 JDY CYAP 133-17-001

Follow Up Flag: Follow up
Flag Status: Flagged

Bill, we would like to run the SLP extract on samples 4140 and 4126. Please analyze the extract from 4140 for Lithium and the extract from 4126 for selenium.

Give me a call with any questions.

Blaine Litteral, P.E.

E & E Solutions, LLC

400 136th Avenue,
Building 100, Suite B,
Holland, Michigan 49424

Cell: (616) 566-4609
Fax: (616) 994-6541

On Thu, Oct 12, 2017 at 4:48 PM, Bill Carey <Bill.Carey@alsglobal.com> wrote:

> Please see attached file.
>
> **Bill Carey**
> Project Manager, Environmental
> Holland Laboratory

T +1 616 399 6070 **D** +1 616 738 7309
F +1 616 399 6185 **M** +1 616 510 3267

bill.carey@alsglobal.com

3352 128th Avenue

Holland, Michigan 49424

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ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **10-Oct-17 16:35**

Work Order: **1710669** Received by: **KRW**

Checklist completed by Keith Wierenga eSignature 10-Oct-17 Date Reviewed by: Bill Carey eSignature 11-Oct-17 Date

Matrices: Soil

Carrier name: Client

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):	14.0/14.0 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/10/2017 4:40:42 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:

Thursday, November 09, 2017

Bill Carey
ALS Environmental
3352 128th Avenue
Holland, MI 49424

Re: ALS Workorder: 1710267
Project Name:
Project Number: 1710669

Dear Mr. Carey:

Five soil samples were received from ALS Environmental, on 10/12/2017. The samples were scheduled for the following analysis:

Gamma Spectroscopy

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

[redacted]

Jeff R. Kujawa
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1710267

Gamma Spectroscopy:
The samples were analyzed for the presence of gamma emitting radionuclides according to HASL 300 Ga-01.

Radium-226 quantification based on the 186.21 keV photon suffers from interference with the 185.72 keV photon emitted by ^{235}U. Due to the high abundance of this photon in ^{235}U emissions, even small amounts of ^{235}U may bias the ^{226}Ra results high. Thus, any measured activity for ^{226}Ra has been flagged with an “SI” qualifier, denoting spectral interference.

All remaining acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1710267
Client Name: ALS Environmental
Client Project Name:
Client Project Number: 1710669
Client PO Number: 20-1710669

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
4144	1710267-1		SOIL	10-Oct-17	15:43
4128	1710267-2		SOIL	10-Oct-17	15:46
4157	1710267-3		SOIL	10-Oct-17	15:50
4140	1710267-4		SOIL	10-Oct-17	15:52
4126	1710267-5		SOIL	10-Oct-17	15:55

1710267

ALS Environmental

Subcontractor:
ALS Environmental, Fort Collins
225 Commerce Dr.
Fort Collins, CO 80524
TEL: (800) 443-1511
FAX:
Acct #:

CHAIN-OF-CUSTODY RECORD

Date: 11-Oct-17
COC ID: 8123
Due D ~~12-Oct-17~~
STD TAT

Salesperson	ALSHN Account

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	1710669	A	Subcontracted Analyses (SUBCONTRACT)
Work Order		Project Number		B	
Company Name	ALS Group USA, Corp	Bill To Company	ALS Group USA, Corp	C	
Send Report To	Bill Carey	Inv Attn	Accounts Payable	D	
Address	3352 128th Ave	Address	3352 128th Ave	E	
				F	
City/State/Zip	Holland, Michigan 49424	City/State/Zip	Holland, Michigan 49424	G	
Phone	(616) 399-6070	Phone	(616) 399-6070	H	
Fax	(616) 399-6185	Fax	(616) 399-6185	I	
eMail Address	bill.carey@alsglobal.com	eMail CC		J	

	ALS Sample ID	Client Sample ID	Matrix	Collection Date 24hr	Bottle	A	B	C	D	E	F	G	H	I	J
1	1710669-01A	4144	Solid	10/Oct/2017 15:43	(1) 4OZGNEAT	X									
2	1710669-02A	4128	Solid	10/Oct/2017 15:46	(1) 4OZGNEAT	X									
3	1710669-03A	4157	Solid	10/Oct/2017 15:50	(1) 4OZGNEAT	X									
4	1710669-04A	4140	Solid	10/Oct/2017 15:52	(1) 4OZGNEAT	X									
5	1710669-05A	4126	Solid	10/Oct/2017 15:55	(1) 4OZGNEAT	X									

Comments:
Please analyze enclosed samples for Radium 226 and Radium 228. Thank you.

Relinquished by:	Date/Time	Received by:	Date/Time	Cooler IDs	Report/QC Level
	10/11/17 1400		10.12.17 @ 1010		Std
Relinquished by:	Date/Time	Received by:	Date/Time		

$196

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS MI Workorder No: 1710267

Project Manager: JK Initials: JA Date: 10.12.17

1.	Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2.	Are custody seals on shipping containers intact?	(NONE)	YES	NO
3.	Are Custody seals on sample containers intact?	(NONE)	YES	NO
4.	Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5.	Are the COC and bottle labels complete and legible?		(YES)	NO
6.	Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7.	Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8.	Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	(N/A)	YES	NO
9.	Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10.	Is there sufficient sample for the requested analyses?		(YES)	NO
11.	Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12.	Are all samples within holding times for the requested analyses?		(YES)	NO
13.	Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15.	Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	(N/A)	YES	NO
16.	Were the samples shipped on ice?		YES	(NO)
17.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	RAD ONLY	YES	(NO)

Cooler #:	1							
Temperature (°C):	AMB							
No. of custody seals on cooler:	0							
DOT Survey/ Acceptance Information — External µR/hr reading:	10							
Background µR/hr reading:	10							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? (YES) / NO / NA (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

- ALL SAMPLE JARS ARE ONLY ABOUT 1/4TH FULL.

If applicable, was the client contacted? YES / NO / (NA) Contact: _____ Date/Time: _____

Project Manager Signature / Date: [signature] 10-13-17

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Ref:
Dept:

Date: 11Oct17
Wgt: 5.00 LBS

DV:

Svcs: STANDARD OVERNIGHT
TRCK: 7261 2422 3359

SHIPPING: 26.9
SPECIAL: 1.2
HANDLING: 0.0
0.00 TOTAL: 28.1

ORIGIN ID:GRRA (616) 399-6070
SAMPLE RECEIVING
ALS ENVIRONMENTAL
3352 128TH AVENUE

HOLLAND, MI 494249263
UNITED STATES US

SHIP DATE: 11OCT17
ACTWGT: 5.00 LB
CAD: 0122071/CAFE3108

BILL SENDER

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
225 COMMERCE DR

10-0

FORT COLLINS CO 80524
(970) 490-1511

INV:
PO:
REF:
DEPT:

FedEx
Express

TRK# 0201 7261 2422 3359

THU - 12 OCT 3:00P
STANDARD OVERNIGHT

NA FTCA

80524
CO-US DEN

FORM 0201 5462/9645/2535 09/08 PRINTED IN U.S.A.

Client:	ALS Environmental	**Date:**	*09-Nov-17*
Project:	1710669	**Work Order:**	1710267
Sample ID:	4144	**Lab ID:**	1710267-1
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/10/2017 15:43	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**			Prep Date: **10/18/2017**	PrepBy: **MRL**
Ra-226	ND (+/- 3.4)	U,G,SI	5.9	pCi/g	NA	11/7/2017 12:22
Ra-228	ND (+/- 1.3)	U,G	2.2	pCi/g	NA	11/7/2017 12:22

Client:	ALS Environmental	**Date:**	*09-Nov-17*
Project:	1710669	**Work Order:**	1710267
Sample ID:	4128	**Lab ID:**	1710267-2
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/10/2017 15:46	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**			Prep Date: **10/18/2017**	PrepBy: **MRL**
Ra-226	ND (+/- 3.4)	U,G,SI	6.1	pCi/g	NA	11/7/2017 13:01
Ra-228	ND (+/- 0.94)	U,G	1.78	pCi/g	NA	11/7/2017 13:01

Client:	ALS Environmental	**Date:**	*09-Nov-17*
Project:	1710669	**Work Order:**	1710267
Sample ID:	4157	**Lab ID:**	1710267-3
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/10/2017 15:50	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**			Prep Date: **10/18/2017**	PrepBy: **MRL**
Ra-226	ND (+/- 3.2)	U,G,SI	5.5	pCi/g	NA	11/7/2017 13:01
Ra-228	ND (+/- 0.86)	U,G	1.79	pCi/g	NA	11/7/2017 13:01

Client:	ALS Environmental	**Date:**	*09-Nov-17*
Project:	1710669	**Work Order:**	1710267
Sample ID:	4140	**Lab ID:**	1710267-4
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/10/2017 15:52	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**			Prep Date: **10/18/2017**	PrepBy: **MRL**
Ra-226	ND (+/- 3.5)	U,G,SI	5.8	pCi/g	NA	11/7/2017 13:01
Ra-228	ND (+/- 1)	U,G	1.9	pCi/g	NA	11/7/2017 13:01

Client:	ALS Environmental	**Date:**	*09-Nov-17*
Project:	1710669	**Work Order:**	1710267
Sample ID:	4126	**Lab ID:**	1710267-5
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/10/2017 15:55	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**			Prep Date: **10/18/2017**	PrepBy: **MRL**
Ra-226	ND (+/- 3.3)	U,G,SI	6.2	pCi/g	NA	11/7/2017 13:02
Ra-228	ND (+/- 0.88)	U,G	1.82	pCi/g	NA	11/7/2017 13:02

Client:	ALS Environmental	**Date:**	*09-Nov-17*
Project:	1710669	**Work Order:**	1710267
Sample ID:	4126	**Lab ID:**	1710267-5
Legal Location:		**Matrix:**	SOIL
Collection Date:	10/10/2017 15:55	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

QC BATCH REPORT

Batch ID: **GS171018-2-1** Instrument ID **GAMMA** Method: **Gamma Spectroscopy Results**

DUP Sample ID: **1710267-5** Units: **pCi/g** Analysis Date: **11/7/2017 13:39**

Client ID: **4126** Run ID: **GS171018-2A** Prep Date: **10/18/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	5.5						-0.7	0.5	2.1	U,G,SI
Ra-228	ND	1.45						-0.19	0.6	2.1	U,G

LCS Sample ID: **GS171018-2** Units: **pCi/g** Analysis Date: **11/7/2017 13:39**

Client ID: Run ID: **GS171018-2A** Prep Date: **10/18/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Am-241	950 (+/- 110)	20	995.1		95.4	85-115					P
Co-60	383 (+/- 45)	1	391.9		97.6	85-115					P
Cs-137	369 (+/- 43)	2	373.9		98.8	85-115					P,M3

MB Sample ID: **GS171018-2** Units: **pCi/g** Analysis Date: **11/7/2017 13:01**

Client ID: Run ID: **GS171018-2A** Prep Date: **10/18/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Am-241	ND	0.81									U
Co-60	ND	0.22									U
Cs-137	ND	0.156									U
Ra-226	ND	1.8									U,SI
Ra-228	ND	0.72									U

The following samples were analyzed in this batch:

1710267-1	1710267-2	1710267-3
1710267-4	1710267-5	

TECHNICAL BULLETIN ADDENDUM

The library used for analysis defines the gamma emission(s) to be used for analysis of each nuclide. If multiple gamma emissions are used for quantification, then a 'NET' quantification emission (or peak) must be defined in the library. This designation provides for the calculation of nuclide activity concentrations and detection limits in the case of non-presence of the nuclide. When the nuclide is not present, or the software is unable to resolve a peak at the library defined 'NET' energy, the software evaluates the 'NET' region of interest ('NET' peak energy +/- 2 keV) by performing a summation of the net counts above the background level. This 'NET' quantification can result in net negative, zero, or positive activity results, and is highly dependent on the spectral distribution in the region of interest of the 'NET' peak. In cases where only the 'NET' peak is found, and the software performs a net quantification, the nuclide result will be flagged with an 'NQ' qualifier on the final reports. This indicates that the nuclide is not detected or supported at any level above the reported MDC. Results are submitted without further qualification.

All nuclides specified in the library of analysis for gamma spectroscopy are evaluated for positive OR tentative identification on the following criteria:

- The individual abundances for the gamma emissions specified for each nuclide are summed to obtain a total nuclide abundance.
- From the total nuclide abundance, a positive identification criterion is set as 75% of this total nuclide abundance.
- For all nuclide peaks that are not net quantified, those peak abundances are summed. The total non-net quantified peak sum is compared to the calculated 75% abundance criterion. If this sum is greater than the 75% criterion, the nuclide is considered to be positively identified at the reported concentration. If the sum is less than the 75% criterion, the nuclide is tentatively identified at the reported concentration. These results will be flagged with a 'TI' qualifier on the final reports to indicate that the 75% abundance criterion was not met.

15-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James Deyoung CYAP** Work Order: **1711923**

Dear Blaine,

ALS Environmental received 2 samples on 13-Nov-2017 04:50 PM 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 industry accepted practices and Quality Control 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 13.

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

ALS Group, USA

Date: 15-Nov-17

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: **1711923**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1711923-01	4018	Solid		11/13/2017 13:59	11/13/2017 16:50	☐
1711923-02	4026	Solid		11/13/2017 14:01	11/13/2017 16:50	☐

ALS Group, USA

Date: 15-Nov-17

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
WorkOrder: **1711923**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *15-Nov-17*

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: 1711923
Sample ID: 4018
Lab ID: 1711923-01
Collection Date: 11/13/2017 01:59 PM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/14/17 15:31		Analyst: **RSH**
Mercury	ND		0.019	mg/Kg-dry	1	11/14/2017 06:22 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/14/17 14:56		Analyst: **JF**
Antimony	ND		0.11	mg/Kg-dry	1	11/14/2017 08:18 PM
Arsenic	**0.96**		**0.045**	**mg/Kg-dry**	1	11/14/2017 08:18 PM
Barium	**4.5**		**0.37**	**mg/Kg-dry**	1	11/14/2017 08:18 PM
Beryllium	ND		0.15	mg/Kg-dry	1	11/14/2017 08:18 PM
Boron	ND		1.5	mg/Kg-dry	1	11/15/2017 11:43 AM
Cadmium	ND		0.074	mg/Kg-dry	1	11/14/2017 08:18 PM
Chromium	**2.2**		**0.37**	**mg/Kg-dry**	1	11/14/2017 08:18 PM
Cobalt	**0.85**		**0.19**	**mg/Kg-dry**	1	11/14/2017 08:18 PM
Lead	**0.90**		**0.37**	**mg/Kg-dry**	1	11/14/2017 08:18 PM
Lithium	**1.5**		**0.15**	**mg/Kg-dry**	1	11/14/2017 08:18 PM
Molybdenum	ND		0.37	mg/Kg-dry	1	11/14/2017 08:18 PM
Selenium	**0.53**		**0.074**	**mg/Kg-dry**	1	11/14/2017 08:18 PM
Thallium	ND		0.19	mg/Kg-dry	1	11/14/2017 08:18 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/14/17 18:00		Analyst: **EE**
Chloride	ND		11	mg/Kg-dry	1	11/15/2017 10:23 AM
Fluoride	ND		1.1	mg/Kg-dry	1	11/15/2017 10:23 AM
Sulfate	**44**		**11**	**mg/Kg-dry**	1	11/15/2017 10:23 AM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**14**		**0.050**	**% of sample**	1	11/15/2017 09:57 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *15-Nov-17*

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: 1711923
Sample ID: 4026
Lab ID: 1711923-02
Collection Date: 11/13/2017 02:01 PM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/14/17 15:31		Analyst: **RSH**
Mercury	ND		0.022	mg/Kg-dry	1	11/14/2017 06:25 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/14/17 14:56		Analyst: **JF**
Antimony	ND		0.13	mg/Kg-dry	1	11/14/2017 08:20 PM
Arsenic	**2.7**		**0.054**	**mg/Kg-dry**	1	11/14/2017 08:20 PM
Barium	**51**		**0.45**	**mg/Kg-dry**	1	11/14/2017 08:20 PM
Beryllium	ND		0.18	mg/Kg-dry	1	11/14/2017 08:20 PM
Boron	**2.7**		**1.8**	**mg/Kg-dry**	1	11/15/2017 11:45 AM
Cadmium	ND		0.089	mg/Kg-dry	1	11/14/2017 08:20 PM
Chromium	**3.3**		**0.45**	**mg/Kg-dry**	1	11/14/2017 08:20 PM
Cobalt	**1.8**		**0.22**	**mg/Kg-dry**	1	11/14/2017 08:20 PM
Lead	**3.0**		**0.45**	**mg/Kg-dry**	1	11/14/2017 08:20 PM
Lithium	**2.7**		**0.18**	**mg/Kg-dry**	1	11/14/2017 08:20 PM
Molybdenum	**0.69**		**0.45**	**mg/Kg-dry**	1	11/14/2017 08:20 PM
Selenium	**0.81**		**0.089**	**mg/Kg-dry**	1	11/14/2017 08:20 PM
Thallium	ND		0.22	mg/Kg-dry	1	11/14/2017 08:20 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/14/17 18:00		Analyst: **EE**
Chloride	ND		12	mg/Kg-dry	1	11/15/2017 10:44 AM
Fluoride	**2.1**		**1.2**	**mg/Kg-dry**	1	11/15/2017 10:44 AM
Sulfate	**88**		**12**	**mg/Kg-dry**	1	11/15/2017 10:44 AM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**16**		**0.050**	**% of sample**	1	11/15/2017 09:57 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 15-Nov-17

Client: Engineering & Environmental Solutions

Work Order: 1711923

Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110548** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-110548-110548**				Units: **mg/Kg**			Analysis Date: **11/14/2017 05:36 P**		
Client ID:	Run ID: **HG1_171114A**				SeqNo: **4760494**		Prep Date: **11/14/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-110548-110548**				Units: **mg/Kg**			Analysis Date: **11/14/2017 05:39 P**		
Client ID:	Run ID: **HG1_171114A**				SeqNo: **4760495**		Prep Date: **11/14/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1925	0.020	0.1665	0	116	80-120	0			

MS	Sample ID: **1711912-01AMS**				Units: **mg/Kg**			Analysis Date: **11/14/2017 06:15 P**		
Client ID:	Run ID: **HG1_171114A**				SeqNo: **4760515**		Prep Date: **11/14/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1688	0.017	0.1388	0.01574	110	75-125	0			

MSD	Sample ID: **1711912-01AMSD**				Units: **mg/Kg**			Analysis Date: **11/14/2017 06:17 P**		
Client ID:	Run ID: **HG1_171114A**				SeqNo: **4760517**		Prep Date: **11/14/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1662	0.017	0.1378	0.01574	109	75-125	0.1688	1.52	35	

The following samples were analyzed in this batch: 1711923-01A 1711923-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711923
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110540** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-110540-110540** Units: **mg/Kg** Analysis Date: **11/14/2017 07:29 P**
Client ID: Run ID: **ICPMS3_171114A** SeqNo: **4759997** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.25								
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Cadmium	ND	0.10								
Chromium	0.0518	0.25								J
Cobalt	ND	0.25								
Lead	0.016	0.25								J
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								
Thallium	ND	0.25								

MBLK Sample ID: **MBLK-110540-110540** Units: **mg/Kg** Analysis Date: **11/15/2017 11:37 A**
Client ID: Run ID: **ICPMS3_171115A** SeqNo: **4761015** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Boron	ND	1.0								

LCS Sample ID: **LCS-110540-110540** Units: **mg/Kg** Analysis Date: **11/14/2017 07:30 P**
Client ID: Run ID: **ICPMS3_171114A** SeqNo: **4759998** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	5.033	0.25	5	0	101	80-120	0			
Arsenic	5.022	0.25	5	0	100	80-120	0			
Barium	5.253	0.25	5	0	105	80-120	0			
Beryllium	5.179	0.10	5	0	104	80-120	0			
Boron	24.89	1.0	25	0	99.6	80-120	0			
Cadmium	5.231	0.10	5	0	105	80-120	0			
Chromium	5.231	0.25	5	0	105	80-120	0			
Cobalt	5.2	0.25	5	0	104	80-120	0			
Lead	5.225	0.25	5	0	105	80-120	0			
Lithium	5.299	0.50	5	0	106	80-120	0			
Molybdenum	5.418	0.25	5	0	108	80-120	0			
Selenium	5.058	0.25	5	0	101	80-120	0			
Thallium	5.137	0.25	5	0	103	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711923
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110540** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1711792-13AMS** Units: **mg/Kg** Analysis Date: **11/14/2017 07:33 P**

Client ID: Run ID: **ICPMS3_171114A** SeqNo: **4760000** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	7.337	0.40	7.974	0.09936	90.8	75-125	0			
Arsenic	11.04	0.40	7.974	4.556	81.3	75-125	0			
Barium	25.55	0.40	7.974	15.54	125	75-125	0			S
Beryllium	8.683	0.16	7.974	0.1315	107	75-125	0			
Boron	39.34	1.6	39.87	0.2387	98.1	75-125	0			
Cadmium	7.879	0.16	7.974	0.1104	97.4	75-125	0			
Chromium	12.36	0.40	7.974	3.096	116	75-125	0			
Cobalt	8.256	0.40	7.974	0.7397	94.3	75-125	0			
Lead	19.37	0.40	7.974	16.73	33.1	75-125	0			S
Lithium	13.05	0.80	7.974	2.444	133	75-125	0			S
Molybdenum	8.45	0.40	7.974	0.332	102	75-125	0			
Selenium	8.684	0.40	7.974	0.773	99.2	75-125	0			
Thallium	7.627	0.40	7.974	0.04681	95	75-125	0			

MSD Sample ID: **1711792-13AMSD** Units: **mg/Kg** Analysis Date: **11/14/2017 07:35 P**

Client ID: Run ID: **ICPMS3_171114A** SeqNo: **4760001** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	7.514	0.40	7.924	0.09936	93.6	75-125	7.337	2.38	20	
Arsenic	11.41	0.40	7.924	4.556	86.4	75-125	11.04	3.28	20	
Barium	26.12	0.40	7.924	15.54	133	75-125	25.55	2.21	20	S
Beryllium	9.027	0.16	7.924	0.1315	112	75-125	8.683	3.89	20	
Boron	41.52	1.6	39.62	0.2387	104	75-125	39.34	5.41	20	
Cadmium	7.866	0.16	7.924	0.1104	97.9	75-125	7.879	0.163	20	
Chromium	12.7	0.40	7.924	3.096	121	75-125	12.36	2.7	20	
Cobalt	8.555	0.40	7.924	0.7397	98.6	75-125	8.256	3.56	20	
Lead	20.76	0.40	7.924	16.73	50.8	75-125	19.37	6.88	20	S
Lithium	13.83	0.79	7.924	2.444	144	75-125	13.05	5.84	20	S
Molybdenum	8.389	0.40	7.924	0.332	102	75-125	8.45	0.72	20	
Selenium	8.737	0.40	7.924	0.773	101	75-125	8.684	0.604	20	
Thallium	7.58	0.40	7.924	0.04681	95.1	75-125	7.627	0.617	20	

The following samples were analyzed in this batch: 1711923-01A 1711923-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711923
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110610** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-110610-110610** Units: **mg/Kg** Analysis Date: **11/15/2017 09:45 A**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761517** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2.926	10								J
Fluoride	ND	1.0								
Sulfate	2.174	10								J

LCS Sample ID: **LCS-110610-110610** Units: **mg/Kg** Analysis Date: **11/15/2017 07:59 A**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761516** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	93.97	10	100	0	94	80-120	0			
Fluoride	20.97	1.0	20	0	105	80-120	0			
Sulfate	97.19	10	100	0	97.2	80-120	0			

MS Sample ID: **1711923-01A MS** Units: **mg/Kg** Analysis Date: **11/15/2017 12:01 P**
Client ID: **4018** Run ID: **IC3_171115A** SeqNo: **4761523** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	91.64	9.7	97.09	5.947	88.3	75-125	0			
Fluoride	19.59	0.97	19.42	0	101	75-125	0			
Sulfate	132.3	9.7	97.09	37.85	97.2	75-125	0			

MSD Sample ID: **1711923-01A MSD** Units: **mg/Kg** Analysis Date: **11/15/2017 12:20 P**
Client ID: **4018** Run ID: **IC3_171115A** SeqNo: **4761524** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	92.68	9.9	99.4	5.947	87.3	75-125	91.64	1.14	20	
Fluoride	19.94	0.99	19.88	0	100	75-125	19.59	1.73	20	
Sulfate	131.6	9.9	99.4	37.85	94.3	75-125	132.3	0.5	20	

The following samples were analyzed in this batch: 1711923-01A 1711923-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711923
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **R224614** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R224614** Units: **% of sample** Analysis Date: **11/15/2017 09:57 A**
Client ID: Run ID: **MOIST_171115A** SeqNo: **4761372** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R224614** Units: **% of sample** Analysis Date: **11/15/2017 09:57 A**
Client ID: Run ID: **MOIST_171115A** SeqNo: **4761371** 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: **1711923-01A DUP** Units: **% of sample** Analysis Date: **11/15/2017 09:57 A**
Client ID: **4018** Run ID: **MOIST_171115A** SeqNo: **4761369** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.09	0.050	0	0	0	0-0	14.5	3.99	5	

The following samples were analyzed in this batch: 1711923-01A 1711923-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Middletown, PA +1 717 944 5541
Spring City, PA +1 610 948 4903
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 38930

ALS Project Manager: | ALS Work Order #: 1711923

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	-	Project Name	James DeYoung CAAP	A	Metals (listed)
Work Order		Project Number	133-17-001	B	Sulfate, Fluoride, Chloride
Company Name	Engineering + Environmental Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	(616) 931-3967	Phone		H	
Fax	(616) 931-3910	Fax		I	
e-Mail Address	Blaine.litteral@goecsolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4018	11/13	1:59	Sand		1	X	X									
2	4028	11/13	2:01	Sand		1	X	X									
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandell Amy Mandell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☒ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandell	Date: 11/13	Time: 4:50pm	Received by:	Notes:	
Relinquished by:	Date: 11/13/17	Time: 1650	Received by (Laboratory):	Cooler ID	Cooler Temp
Logged by (Laboratory): NJF	Date: 11-14-17	Time: 1150	Checked by (Laboratory):	SR2	5.8

QC Package: (Check One Box Below)
☐ Level II Std QC ☒ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☒ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Antimony

Arsenic

Barium

Beryllium

Boron

Cadmium

Chromium

Cobalt

Lead

Lithium

Mercury

Molybdenum

Selenium

Thallium

Sulfate

Fluoride

Chloride

Radium 226 & 228 Combined - hold off on, with all

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **13-Nov-17 16:50**

Work Order: **1711923** Received by: **NCF**

Checklist completed by Nicole Fredericks (eSignature) 14-Nov-17 (Date) Reviewed by: Bill Carey (eSignature) 15-Nov-17 (Date)

Matrices: Solid

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):	5.8/5.8	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/14/201711:59:23 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:

15-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **JDY CYAP** Work Order: **17101168**

Dear Blaine, Revision: **1**

ALS Environmental received 2 samples on 18-Oct-2017 11:26 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 industry accepted practices and Quality Control 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 24.

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

ALS Group, USA

Date: 15-Nov-17

Client: Engineering & Environmental Solutions
Project: JDY CYAP
Work Order: **17101168**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
17101168-01	4126-2	Solid		10/18/2017 11:00	10/18/2017 11:26	☐
17101168-02	4140-2	Solid		10/18/2017 11:00	10/18/2017 11:26	☐

ALS Group, USA

Date: 15-Nov-17

Client: Engineering & Environmental Solutions
Project: JDY CYAP
WorkOrder: **17101168**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
as noted	
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *15-Nov-17*

Client: Engineering & Environmental Solutions
Project: JDY CYAP
Work Order: 17101168
Sample ID: 4126-2
Lab ID: 17101168-01
Collection Date: 10/18/2017 11:00 AM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/20/17 11:50		Analyst: **RSH**
Mercury	**0.048**		**0.019**	**mg/Kg-dry**	1	10/20/2017 02:13 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/19/17 14:07		Analyst: **JF**
Antimony	ND		0.12	mg/Kg-dry	1	10/20/2017 09:12 PM
Arsenic	**14**		**0.046**	**mg/Kg-dry**	1	10/20/2017 09:12 PM
Barium	**15**		**0.38**	**mg/Kg-dry**	1	10/20/2017 09:12 PM
Beryllium	**0.27**		**0.15**	**mg/Kg-dry**	1	10/23/2017 01:25 PM
Boron	**2.4**		**1.5**	**mg/Kg-dry**	1	10/23/2017 01:25 PM
Cadmium	**0.31**		**0.077**	**mg/Kg-dry**	1	10/20/2017 09:12 PM
Chromium	**6.9**		**0.38**	**mg/Kg-dry**	1	10/20/2017 09:12 PM
Cobalt	**2.0**		**0.19**	**mg/Kg-dry**	1	10/20/2017 09:12 PM
Lead	**3.5**		**0.38**	**mg/Kg-dry**	1	10/20/2017 09:12 PM
Lithium	**3.3**		**0.15**	**mg/Kg-dry**	1	10/23/2017 01:25 PM
Molybdenum	**2.3**		**0.38**	**mg/Kg-dry**	1	10/20/2017 09:12 PM
Selenium	**1.1**		**0.077**	**mg/Kg-dry**	1	10/20/2017 09:12 PM
Thallium	ND		0.19	mg/Kg-dry	1	10/20/2017 09:12 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/19/17 11:00		Analyst: **EE**
Chloride	ND		12	mg/Kg-dry	1	10/20/2017 11:56 AM
Fluoride	ND		1.2	mg/Kg-dry	1	10/20/2017 11:56 AM
Sulfate	**1,500**		**240**	**mg/Kg-dry**	20	10/20/2017 01:32 PM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**16**		**0.050**	**% of sample**	1	10/18/2017 03:41 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	10/31/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *15-Nov-17*

Client: Engineering & Environmental Solutions
Project: JDY CYAP
Work Order: 17101168
Sample ID: 4140-2
Lab ID: 17101168-02
Collection Date: 10/18/2017 11:00 AM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 10/20/17 11:50		Analyst: **RSH**
Mercury	**0.050**		**0.020**	**mg/Kg-dry**	1	10/20/2017 02:15 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 10/19/17 14:07		Analyst: **JF**
Antimony	**0.18**		**0.12**	**mg/Kg-dry**	1	10/20/2017 09:13 PM
Arsenic	**11**		**0.048**	**mg/Kg-dry**	1	10/20/2017 09:13 PM
Barium	**62**		**0.40**	**mg/Kg-dry**	1	10/20/2017 09:13 PM
Beryllium	**0.27**		**0.16**	**mg/Kg-dry**	1	10/23/2017 01:26 PM
Boron	**3.3**		**1.6**	**mg/Kg-dry**	1	10/23/2017 01:26 PM
Cadmium	ND		0.079	mg/Kg-dry	1	10/20/2017 09:13 PM
Chromium	**3.8**		**0.40**	**mg/Kg-dry**	1	10/20/2017 09:13 PM
Cobalt	**2.6**		**0.20**	**mg/Kg-dry**	1	10/20/2017 09:13 PM
Lead	**8.7**		**0.40**	**mg/Kg-dry**	1	10/20/2017 09:13 PM
Lithium	**8.3**		**0.16**	**mg/Kg-dry**	1	10/23/2017 01:26 PM
Molybdenum	**17**		**0.40**	**mg/Kg-dry**	1	10/20/2017 09:13 PM
Selenium	**1.6**		**0.079**	**mg/Kg-dry**	1	10/20/2017 09:13 PM
Thallium	ND		0.20	mg/Kg-dry	1	10/20/2017 09:13 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 10/19/17 11:00		Analyst: **EE**
Chloride	**24**		**12**	**mg/Kg-dry**	1	10/20/2017 12:16 PM
Fluoride	**3.7**		**1.2**	**mg/Kg-dry**	1	10/20/2017 12:16 PM
Sulfate	**160**		**12**	**mg/Kg-dry**	1	10/20/2017 12:16 PM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**18**		**0.050**	**% of sample**	1	10/18/2017 03:41 PM
SUBCONTRACTED ANALYSES			**SUBCONTRACT**			Analyst: **ALS**
Subcontracted Analyses	**See report**			**as noted**	1	10/31/2017

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: 15-Nov-17

Client: Engineering & Environmental Solutions

Work Order: 17101168

Project: JDY CYAP

QC BATCH REPORT

Batch ID: **109358** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-109358-109358** Units: **mg/Kg** Analysis Date: **10/20/2017 01:23 P**

Client ID: Run ID: **HG1_171020A** SeqNo: **4712307** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-109358-109358** Units: **mg/Kg** Analysis Date: **10/20/2017 01:25 P**

Client ID: Run ID: **HG1_171020A** SeqNo: **4712308** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1575	0.020	0.1665	0	94.6	80-120	0			

MS Sample ID: **17101000-07AMS** Units: **mg/Kg** Analysis Date: **10/20/2017 02:05 P**

Client ID: Run ID: **HG1_171020A** SeqNo: **4712420** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1981	0.018	0.1471	0.05305	98.6	75-125	0			

MSD Sample ID: **17101000-07AMSD** Units: **mg/Kg** Analysis Date: **10/20/2017 02:08 P**

Client ID: Run ID: **HG1_171020A** SeqNo: **4712421** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1982	0.018	0.1467	0.05305	99	75-125	0.1981	0.0769	35	

The following samples were analyzed in this batch:

17101168-01A	17101168-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

QC BATCH REPORT

Batch ID: **109300** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-109300-109300** Units: **mg/Kg** Analysis Date: **10/20/2017 08:54 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714468** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.25								
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	0.00235	0.10								J
Boron	ND	1.0								
Cadmium	0.0025	0.10								J
Chromium	0.02145	0.25								J
Cobalt	ND	0.25								
Lead	0.01205	0.25								J
Lithium	ND	0.50								
Molybdenum	0.0504	0.25								J
Selenium	ND	0.25								
Thallium	0.00295	0.25								J

LCS Sample ID: **LCS-109300-109300** Units: **mg/Kg** Analysis Date: **10/20/2017 08:55 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714470** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.715	0.25	5	0	94.3	80-120	0			
Arsenic	4.716	0.25	5	0	94.3	80-120	0			
Barium	5.121	0.25	5	0	102	80-120	0			
Beryllium	4.841	0.10	5	0	96.8	80-120	0			
Boron	24.7	1.0	25	0	98.8	80-120	0			
Cadmium	4.991	0.10	5	0	99.8	80-120	0			
Chromium	4.86	0.25	5	0	97.2	80-120	0			
Cobalt	4.684	0.25	5	0	93.7	80-120	0			
Lead	4.983	0.25	5	0	99.7	80-120	0			
Lithium	5.066	0.50	5	0	101	80-120	0			
Molybdenum	5.124	0.25	5	0	102	80-120	0			
Selenium	4.845	0.25	5	0	96.9	80-120	0			
Thallium	4.95	0.25	5	0	99	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 17101168
Project: JDY CYAP

QC BATCH REPORT

Batch ID: **109300** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1710945-02BMS** Units: **mg/Kg** Analysis Date: **10/20/2017 10:00 P**

Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714524** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	5.698	0.37	7.452	0.04349	75.9	75-125	0			
Arsenic	8.314	0.37	7.452	1.886	86.3	75-125	0			
Barium	24.53	0.37	7.452	13.48	148	75-125	0			S
Beryllium	7.503	0.15	7.452	0.1278	99	75-125	0			
Boron	42.37	1.5	37.26	4.335	102	75-125	0			
Cadmium	5.908	0.15	7.452	0.003967	79.2	75-125	0			
Chromium	17.26	0.37	7.452	5.117	163	75-125	0			S
Cobalt	8.027	0.37	7.452	2.272	77.2	75-125	0			
Lead	11.51	0.37	7.452	4.427	95.1	75-125	0			
Molybdenum	8.013	0.37	7.452	0.2835	104	75-125	0			
Selenium	7.294	0.37	7.452	0.6593	89	75-125	0			
Thallium	7.833	0.37	7.452	0.09469	104	75-125	0			

MSD Sample ID: **1710945-02BMSD** Units: **mg/Kg** Analysis Date: **10/20/2017 10:02 P**

Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714525** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	5.468	0.38	7.519	0.04349	72.2	75-125	5.698	4.12	20	S
Arsenic	7.988	0.38	7.519	1.886	81.2	75-125	8.314	4	20	
Barium	24.18	0.38	7.519	13.48	142	75-125	24.53	1.43	20	S
Beryllium	7.121	0.15	7.519	0.1278	93	75-125	7.503	5.23	20	
Boron	41.17	1.5	37.59	4.335	98	75-125	42.37	2.87	20	
Cadmium	5.763	0.15	7.519	0.003967	76.6	75-125	5.908	2.48	20	
Chromium	13.31	0.38	7.519	5.117	109	75-125	17.26	25.9	20	R
Cobalt	7.802	0.38	7.519	2.272	73.5	75-125	8.027	2.85	20	S
Lead	11.4	0.38	7.519	4.427	92.7	75-125	11.51	0.985	20	
Molybdenum	6.976	0.38	7.519	0.2835	89	75-125	8.013	13.8	20	
Selenium	6.897	0.38	7.519	0.6593	83	75-125	7.294	5.6	20	
Thallium	7.551	0.38	7.519	0.09469	99.2	75-125	7.833	3.67	20	

The following samples were analyzed in this batch: 17101168-01A 17101168-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 17101168
Project: JDY CYAP

QC BATCH REPORT

Batch ID: **109369** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-109369-109369** Units: **mg/Kg** Analysis Date: **10/20/2017 09:42 A**
Client ID: Run ID: **IC4_171020A** SeqNo: **4712788** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	10								
Fluoride	ND	1.0								
Sulfate	ND	10								

LCS Sample ID: **LCS-109369-109369** Units: **mg/Kg** Analysis Date: **10/20/2017 10:01 A**
Client ID: Run ID: **IC4_171020A** SeqNo: **4712789** Prep Date: **10/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	91.37	10	100	0	91.4	80-120	0			
Fluoride	19.16	1.0	20	0	95.8	80-120	0			
Sulfate	95.78	10	100	0	95.8	80-120	0			

MS Sample ID: **1710867-21A MS** Units: **mg/Kg** Analysis Date: **10/20/2017 10:40 A**
Client ID: Run ID: **IC4_171020A** SeqNo: **4712791** Prep Date: **10/19/2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	694.1	49	97.47	642	53.4	75-125	0			SO
Fluoride	17	4.9	19.49	0	87.2	75-125	0			
Sulfate	99.8	49	97.47	20.27	81.6	75-125	0			

MSD Sample ID: **1710867-21A MSD** Units: **mg/Kg** Analysis Date: **10/20/2017 10:59 A**
Client ID: Run ID: **IC4_171020A** SeqNo: **4712792** Prep Date: **10/19/2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	699.5	49	97.47	642	59	75-125	694.1	0.774	20	SO
Fluoride	16.58	4.9	19.49	0	85	75-125	17	2.5	20	
Sulfate	20.65	49	97.47	20.27	0.397	75-125	99.8	0	20	JS

The following samples were analyzed in this batch: 17101168-01A 17101168-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 17101168
Project: JDY CYAP

QC BATCH REPORT

Batch ID: **R222581** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R222581** Units: **% of sample** Analysis Date: **10/18/2017 03:41 P**
Client ID: Run ID: **MOIST_171018D** SeqNo: **4709125** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R222581** Units: **% of sample** Analysis Date: **10/18/2017 03:41 P**
Client ID: Run ID: **MOIST_171018D** SeqNo: **4709124** 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: **17101112-01A DUP** Units: **% of sample** Analysis Date: **10/18/2017 03:41 P**
Client ID: Run ID: **MOIST_171018D** SeqNo: **4709103** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	24.49	0.050	0	0	0	0-0	24.38	0.45	5	

DUP Sample ID: **17101112-04A DUP** Units: **% of sample** Analysis Date: **10/18/2017 03:41 P**
Client ID: Run ID: **MOIST_171018D** SeqNo: **4709107** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	16.25	0.050	0	0	0	0-0	16.12	0.803	5	

The following samples were analyzed in this batch:

17101168-01A	17101168-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 38870

ALS Project Manager: | ALS Work Order #: 1710108

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	JDY CYAP	A	Metals (listed)
Work Order		Project Number	33-17-001	B	Sulfate, fluoride, chloride
Company Name	E+E Solutions	Bill To Company	Holland BPW	C	Radium 226 + 228 combined
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	400 E 136th 100B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4626-2	10/18	11:00	Sand			X	X	X								
2	4040-2	10/18	11:00	Sand			X	X	X								
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Mitch Stark

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☒ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Date: 10/18	Time: 11:26	Received by:	Notes:
Relinquished by:	Date: 10/18/17	Time: 1126	Received by (Laboratory):	
Logged by (Laboratory): NJF	Date: 10-18-17	Time: 1145	Checked by (Laboratory):	

Cooler ID	Cooler Temp
SR2	4.6

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Bill Carey

From: Blaine Litteral <blaine.litteral@goeesolutions.net>
Sent: Monday, November 13, 2017 4:46 PM
To: Bill Carey
Subject: Re: 17101168 JDY CYAP

Follow Up Flag: Follow up
Flag Status: Flagged

Bill,

This are the samples that Kurt called you earlier about. The correct numbering is 4126-2 and 4140-2 rather than 4026-2 and 4040-2. These were retests of an earlier sample location so need numbered the same.

Blaine Litteral, P.E.

E & E Solutions, LLC

400 136th Avenue,
Building 100, Suite B,
Holland, Michigan 49424

Cell: (616) 566-4609
Fax: (616) 994-6541

On Fri, Nov 10, 2017 at 2:41 PM, Bill Carey <Bill.Carey@alsglobal.com> wrote:

> Results of the analyses for the samples we received are attached. The project invoice is also 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, Environmental
Holland Laboratory

T +1 616 399 6070 **D** +1 616 738 7309
F +1 616 399 6185 **M** +1 616 510 3267

bill.carey@alsglobal.com

3352 128th Avenue

Holland, Michigan 49424

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ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **18-Oct-17 11:26**

Work Order: **17101168** Received by: **DS**

Checklist completed by Nicole Fredericks (eSignature) 18-Oct-17 (Date) Reviewed by: Bill Carey (eSignature) 19-Oct-17 (Date)

Matrices: Solid

Carrier name: Courier

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):	4.6/4.6	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/18/201711:56:25 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:

Friday, November 03, 2017

Bill Carey
ALS Environmental
3352 128th Avenue
Holland, MI 49424

Re: ALS Workorder: 1710442
Project Name:
Project Number: 17101168

Dear Mr. Carey:

One solid sample was received from ALS Environmental, on 10/20/2017. The sample was scheduled for the following analysis:

Gamma Spectroscopy

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

[redacted]

Jeff R. Kujawa
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1710442

Gamma Spectroscopy:

The sample was analyzed for the presence of gamma emitting radionuclides according to HASL 300 Ga-01.

All acceptance criteria were met, with the following exception:

Radium-226 quantification based on the 186.21 keV photon suffers from interference with the 185.72 keV photon emitted by ^{235}U. Due to the high abundance of this photon in ^{235}U emissions, even small amounts of ^{235}U may bias the ^{226}Ra results high. Thus, any measured activity for ^{226}Ra has been flagged with an “SI” qualifier, denoting spectral interference.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1710442
Client Name: ALS Environmental
Client Project Name:
Client Project Number: 17101168
Client PO Number: 20-17101168

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
4126-2	1710442-1		SOLID	18-Oct-17	11:00

1710442

ALS Environmental

Subcontractor:
ALS Environmental, Fort Collins
225 Commerce Dr.
Fort Collins, CO 80524
TEL: (800) 443-1511
FAX:
Acct #:

CHAIN-OF-CUSTODY RECORD

Date: 19-Oct-17
COC ID: 8147
Due D ~~20-Oct-17~~ STD

Salesperson	ALSHN Account

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	17101168	A	Subcontracted Analyses (SUBCONTRACT)
Work Order		Project Number		B	
Company Name	ALS Group USA, Corp	Bill To Company	ALS Group USA, Corp	C	
Send Report To	Bill Carey	Inv Attn	Accounts Payable	D	
Address	3352 128th Ave	Address	3352 128th Ave	E	
				F	
City/State/Zip	Holland, Michigan 49424	City/State/Zip	Holland, Michigan 49424	G	
Phone	(616) 399-6070	Phone	(616) 399-6070	H	
Fax	(616) 399-6185	Fax	(616) 399-6185	I	
eMail Address	bill.carey@alsglobal.com	eMail CC		J	

	ALS Sample ID	Client Sample ID	Matrix	Collection Date 24hr	Bottle	A	B	C	D	E	F	G	H	I	J
1	17101168-01B	4026-2	Solid	18/Oct/2017 11:00	(1) 4OZGNEAT	X									
2	17101168-02B	4040-2	Solid	18/Oct/2017 11:00	(1) 4OZGNEAT	X									

Comments:

Please analyze enclosed samples for Radium 226 and Radium 228. Thank you.

10/19/17 1400 10/20/17 09:10

Relinquished by:	Date/Time	Received by:	Date/Time	Cooler IDs	Report/QC Level
					Std
Relinquished by:	Date/Time	Received by:	Date/Time		

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Holland Workorder No: 1710442

Project Manager: JK Initials: NJ Date: 10/20/17

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	(N/A)	YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		YES	(NO)
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	(N/A)	YES	NO
16. Were the samples shipped on ice?		YES	(NO)
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	RAD ONLY	YES	(NO)

Cooler #:	1							
Temperature (°C):	Amb							
No. of custody seals on cooler:	0							
DOT Survey/ Acceptance Information: External µR/hr reading:	10							
Background µR/hr reading:	10							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

- Sample 2 broken jar

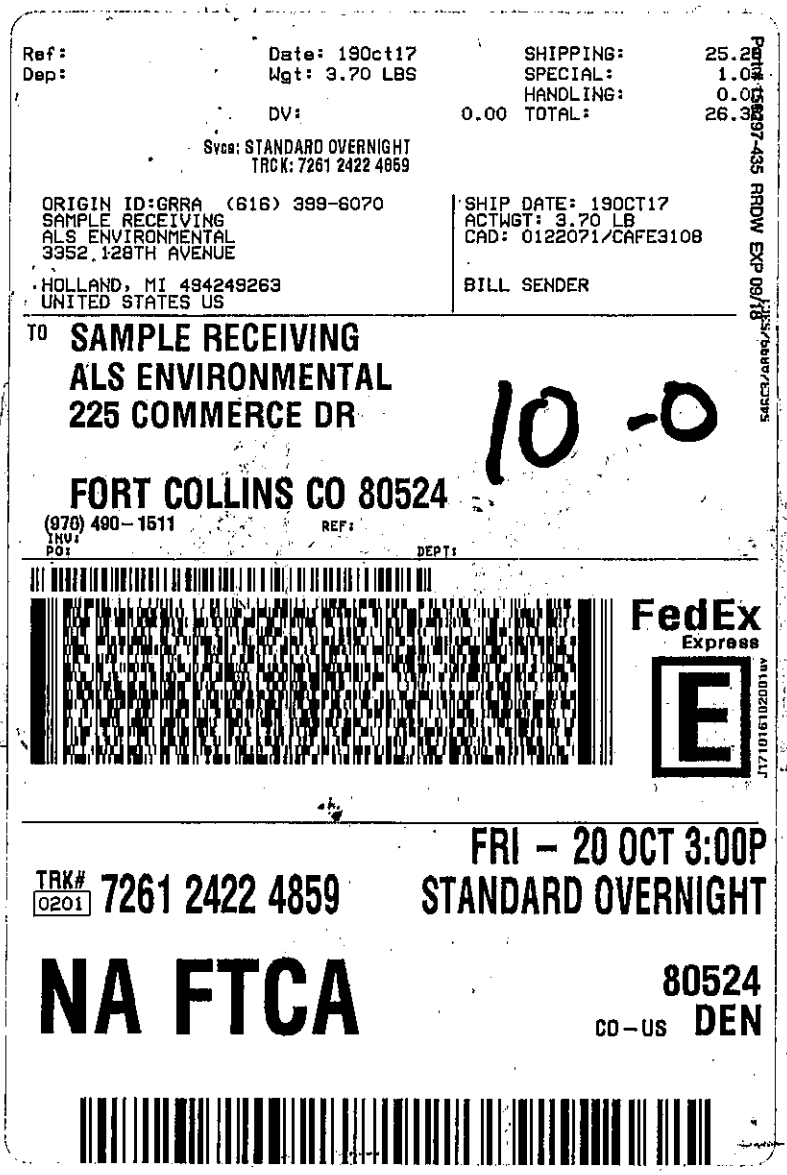
If applicable, was the client contacted? (YES) / NO / NA Contact: B. Carey Date/Time: 10-20-17

Project Manager Signature / Date: 10-20-17

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

1710442



Ref:
Dep:
Date: 19Oct17
Wgt: 3.70 LBS
DV:
SHIPPING: 25.2
SPECIAL: 1.0
HANDLING: 0.0
0.00 TOTAL: 26.3
Svcs: STANDARD OVERNIGHT
TRCK: 7261 2422 4859
Part # 154297-435 ARROW EXP 08/18
ORIGIN ID:GRRA (616) 399-6070
SAMPLE RECEIVING
ALS ENVIRONMENTAL
3352 128TH AVENUE
HOLLAND, MI 494249263
UNITED STATES US
SHIP DATE: 19OCT17
ACTWGT: 3.70 LB
CAD: 0122071/CAFE3108
BILL SENDER
TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
225 COMMERCE DR
FORT COLLINS CO 80524
(970) 490-1511
REF:
INV:
PO:
DEPT:
10-0
FedEx Express
E
TRK# 0201 7261 2422 4859
FRI - 20 OCT 3:00P
STANDARD OVERNIGHT
NA FTCA
80524
CO-US DEN

Client:	ALS Environmental	**Date:**	*03-Nov-17*
Project:	17101168	**Work Order:**	1710442
Sample ID:	4126-2	**Lab ID:**	1710442-1
Legal Location:		**Matrix:**	SOLID
Collection Date:	10/18/2017 11:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Gamma Spectroscopy Results		**PAI 713**		Prep Date: **10/24/2017**		PrepBy: **MRL**
Ra-226	ND (+/- 3.3)	U,G,SI	6.2	pCi/g	NA	10/31/2017 10:20
Ra-228	ND (+/- 1.1)	U,G	1.8	pCi/g	NA	10/31/2017 10:20

Client:	ALS Environmental	**Date:**	*03-Nov-17*
Project:	17101168	**Work Order:**	1710442
Sample ID:	4126-2	**Lab ID:**	1710442-1
Legal Location:		**Matrix:**	SOLID
Collection Date:	10/18/2017 11:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

QC BATCH REPORT

Batch ID: **GS171024-2-2** Instrument ID: **GAMMA** Method: **Gamma Spectroscopy Results**

LCS Sample ID: **GS171024-2** Units: **pCi/g** Analysis Date: **10/31/2017 11:07**

Client ID: Run ID: **GS171024-2A** Prep Date: **10/24/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Am-241	990 (+/- 120)	20	995.2		99.6	85-115					P
Co-60	394 (+/- 46)	1	392.9		100	85-115					P
Cs-137	377 (+/- 44)	2	374.1		101	85-115					P,M3

MB Sample ID: **GS171024-2A** Units: **pCi/g** Analysis Date: **10/31/2017 10:54**

Client ID: Run ID: **GS171024-2A** Prep Date: **10/24/2017** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Am-241	ND	0.54									U
Co-60	ND	0.129									U
Cs-137	ND	0.119									U
Ra-226	ND	1.75									U,SI
Ra-228	ND	0.56									U

The following samples were analyzed in this batch: 1710442-1

16-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James Deyoung CYAP** Work Order: **1711988**

Dear Blaine, Revision: **1**

ALS Environmental received 1 sample on 14-Nov-2017 03:50 PM 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 industry accepted practices and Quality Control 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 12.

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

Report of Laboratory Analysis

ALS Group, USA

Date: 16-Nov-17

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: **1711988**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1711988-01	4089	Solid		11/14/2017 14:48	11/14/2017 15:50	☐

ALS Group, USA

Date: 16-Nov-17

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
WorkOrder: **1711988**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *16-Nov-17*

Client: Engineering & Environmental Solutions
Project: James Deyoung CYAP
Work Order: 1711988
Sample ID: 4089
Lab ID: 1711988-01
Collection Date: 11/14/2017 02:48 PM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/15/17 15:39		Analyst: **RSH**
Mercury	ND		0.022	mg/Kg-dry	1	11/15/2017 05:21 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/15/17 11:08		Analyst: **JF**
Antimony	ND		0.14	mg/Kg-dry	1	11/15/2017 04:22 PM
Arsenic	**0.95**		**0.055**	**mg/Kg-dry**	1	11/15/2017 04:22 PM
Barium	**10**		**0.46**	**mg/Kg-dry**	1	11/15/2017 04:22 PM
Beryllium	ND		0.18	mg/Kg-dry	1	11/15/2017 04:22 PM
Boron	ND		1.8	mg/Kg-dry	1	11/15/2017 04:22 PM
Cadmium	ND		0.092	mg/Kg-dry	1	11/15/2017 04:22 PM
Chromium	**2.5**		**0.46**	**mg/Kg-dry**	1	11/15/2017 04:22 PM
Cobalt	**1.5**		**0.23**	**mg/Kg-dry**	1	11/15/2017 04:22 PM
Lead	**2.7**		**0.46**	**mg/Kg-dry**	1	11/15/2017 04:22 PM
Lithium	**1.8**		**0.18**	**mg/Kg-dry**	1	11/15/2017 04:22 PM
Molybdenum	ND		0.46	mg/Kg-dry	1	11/15/2017 04:22 PM
Selenium	**0.60**		**0.092**	**mg/Kg-dry**	1	11/15/2017 04:22 PM
Thallium	ND		0.23	mg/Kg-dry	1	11/15/2017 04:22 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/14/17 18:00		Analyst: **EE**
Chloride	**35**		**12**	**mg/Kg-dry**	1	11/15/2017 11:03 AM
Fluoride	**3.7**		**1.2**	**mg/Kg-dry**	1	11/15/2017 11:03 AM
Sulfate	**750**		**120**	**mg/Kg-dry**	10	11/15/2017 12:39 PM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**17**		**0.050**	**% of sample**	1	11/15/2017 07:55 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

QC BATCH REPORT

Batch ID: **110617** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-110617-110617** Units: **mg/Kg** Analysis Date: **11/15/2017 04:35 P**

Client ID: Run ID: **HG1_171115A** SeqNo: **4762379** Prep Date: **11/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-110617-110617** Units: **mg/Kg** Analysis Date: **11/15/2017 04:38 P**

Client ID: Run ID: **HG1_171115A** SeqNo: **4762380** Prep Date: **11/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1808	0.020	0.1665	0	109	80-120	0			

MS Sample ID: **1711968-01CMS** Units: **mg/Kg** Analysis Date: **11/15/2017 05:05 P**

Client ID: Run ID: **HG1_171115A** SeqNo: **4762390** Prep Date: **11/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1566	0.017	0.1435	0.01533	98.4	75-125	0			

MSD Sample ID: **1711968-01CMSD** Units: **mg/Kg** Analysis Date: **11/15/2017 05:08 P**

Client ID: Run ID: **HG1_171115A** SeqNo: **4762391** Prep Date: **11/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1586	0.018	0.1461	0.01533	98.1	75-125	0.1566	1.28	35	

The following samples were analyzed in this batch: 1711988-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1711988
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110582** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-110582-110582** Units: **mg/Kg** Analysis Date: **11/15/2017 03:35 P**
Client ID: Run ID: **ICPMS3_171115A** SeqNo: **4762787** Prep Date: **11/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.25								
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	ND	1.0								
Cadmium	ND	0.10								
Chromium	0.04895	0.25								J
Cobalt	ND	0.25								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								
Thallium	ND	0.25								

LCS Sample ID: **LCS-110582-110582** Units: **mg/Kg** Analysis Date: **11/15/2017 03:37 P**
Client ID: Run ID: **ICPMS3_171115A** SeqNo: **4762788** Prep Date: **11/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.756	0.25	5	0	95.1	80-120	0			
Arsenic	4.707	0.25	5	0	94.1	80-120	0			
Barium	4.91	0.25	5	0	98.2	80-120	0			
Beryllium	4.746	0.10	5	0	94.9	80-120	0			
Boron	23.46	1.0	25	0	93.8	80-120	0			
Cadmium	4.772	0.10	5	0	95.4	80-120	0			
Chromium	4.896	0.25	5	0	97.9	80-120	0			
Cobalt	4.889	0.25	5	0	97.8	80-120	0			
Lead	4.915	0.25	5	0	98.3	80-120	0			
Lithium	4.819	0.50	5	0	96.4	80-120	0			
Molybdenum	5.059	0.25	5	0	101	80-120	0			
Selenium	4.664	0.25	5	0	93.3	80-120	0			
Thallium	4.955	0.25	5	0	99.1	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1711988
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110582** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1711967-02AMS** Units: **mg/Kg** Analysis Date: **11/15/2017 04:00 P**
Client ID: Run ID: **ICPMS3_171115A** SeqNo: **4762803** Prep Date: **11/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.329	0.37	7.485	0.2451	54.6	75-125	0			S
Arsenic	12.33	0.37	7.485	6.77	74.3	75-125	0			S
Barium	261.7	0.37	7.485	146.8	1530	75-125	0			SEO
Beryllium	8.736	0.15	7.485	0.819	106	75-125	0			
Boron	37.16	1.5	37.43	1.06	96.5	75-125	0			
Cadmium	4.817	0.15	7.485	0.1185	62.8	75-125	0			S
Chromium	14.14	0.37	7.485	7.437	89.5	75-125	0			
Cobalt	14.94	0.37	7.485	7.037	106	75-125	0			
Lead	46.98	0.37	7.485	31.56	206	75-125	0			SO
Lithium	13.64	0.75	7.485	3.301	138	75-125	0			S
Molybdenum	5.778	0.37	7.485	0.6694	68.3	75-125	0			S
Selenium	7.085	0.37	7.485	2.318	63.7	75-125	0			S
Thallium	6.988	0.37	7.485	0.155	91.3	75-125	0			

MSD Sample ID: **1711967-02AMSD** Units: **mg/Kg** Analysis Date: **11/15/2017 04:02 P**
Client ID: Run ID: **ICPMS3_171115A** SeqNo: **4762804** Prep Date: **11/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.544	0.37	7.452	0.2451	57.7	75-125	4.329	4.84	20	S
Arsenic	11.35	0.37	7.452	6.77	61.4	75-125	12.33	8.34	20	S
Barium	142.7	0.37	7.452	146.8	-56	75-125	261.7	58.9	20	SREO
Beryllium	8.692	0.15	7.452	0.819	106	75-125	8.736	0.504	20	
Boron	37.67	1.5	37.26	1.06	98.3	75-125	37.16	1.35	20	
Cadmium	4.868	0.15	7.452	0.1185	63.7	75-125	4.817	1.05	20	S
Chromium	14.05	0.37	7.452	7.437	88.8	75-125	14.14	0.585	20	
Cobalt	10.27	0.37	7.452	7.037	43.4	75-125	14.94	37.1	20	SR
Lead	38.12	0.37	7.452	31.56	88.1	75-125	46.98	20.8	20	RO
Lithium	13.53	0.75	7.452	3.301	137	75-125	13.64	0.807	20	S
Molybdenum	5.653	0.37	7.452	0.6694	66.9	75-125	5.778	2.18	20	S
Selenium	6.983	0.37	7.452	2.318	62.6	75-125	7.085	1.45	20	S
Thallium	7.031	0.37	7.452	0.155	92.3	75-125	6.988	0.616	20	

The following samples were analyzed in this batch: 1711988-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1711988
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **110610** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-110610-110610** Units: **mg/Kg** Analysis Date: **11/15/2017 09:45 A**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761517** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2.926	10								J
Fluoride	ND	1.0								
Sulfate	2.174	10								J

LCS Sample ID: **LCS-110610-110610** Units: **mg/Kg** Analysis Date: **11/15/2017 07:59 A**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761516** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	93.97	10	100	0	94	80-120	0			
Fluoride	20.97	1.0	20	0	105	80-120	0			
Sulfate	97.19	10	100	0	97.2	80-120	0			

MS Sample ID: **1711923-01A MS** Units: **mg/Kg** Analysis Date: **11/15/2017 12:01 P**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761523** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	91.64	9.7	97.09	5.947	88.3	75-125	0			
Fluoride	19.59	0.97	19.42	0	101	75-125	0			
Sulfate	132.3	9.7	97.09	37.85	97.2	75-125	0			

MSD Sample ID: **1711923-01A MSD** Units: **mg/Kg** Analysis Date: **11/15/2017 12:20 P**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761524** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	92.68	9.9	99.4	5.947	87.3	75-125	91.64	1.14	20	
Fluoride	19.94	0.99	19.88	0	100	75-125	19.59	1.73	20	
Sulfate	131.6	9.9	99.4	37.85	94.3	75-125	132.3	0.5	20	

The following samples were analyzed in this batch: 1711988-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1711988
Project: James Deyoung CYAP

QC BATCH REPORT

Batch ID: **R224671** Instrument ID **MOIST** Method: **SW3550C**

MBLK	Sample ID: **WBLKS-R224671**				Units: **% of sample**			Analysis Date: **11/15/2017 07:55 A**			
Client ID:	Run ID: **MOIST_171115B**				SeqNo: **4762245**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Moisture	ND	0.050									

LCS	Sample ID: **LCS-R224671**				Units: **% of sample**			Analysis Date: **11/15/2017 07:55 A**			
Client ID:	Run ID: **MOIST_171115B**				SeqNo: **4762244**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Moisture	99.99	0.050	100	0	100	99.5-100.5	0				

DUP	Sample ID: **1711793-28A DUP**				Units: **% of sample**			Analysis Date: **11/15/2017 07:55 A**			
Client ID:	Run ID: **MOIST_171115B**				SeqNo: **4762235**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Moisture	15.11	0.050	0	0	0	0-0	14.34	5.23	5	R	

DUP	Sample ID: **1711988-01A DUP**				Units: **% of sample**			Analysis Date: **11/15/2017 07:55 A**			
Client ID: **4089**	Run ID: **MOIST_171115B**				SeqNo: **4762243**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Moisture	17.09	0.050	0	0	0	0-0	16.57	3.09	5		

The following samples were analyzed in this batch: 1711988-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 38929

ALS Project Manager: | ALS Work Order #: 1711988

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CMP	A	Metals (listed)
Work Order		Project Number	Holland BPW 133-17-001	B	Sulfate fluoride chloride
Company Name	Engineering + Environmental Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Utteral	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	(616)931-3967	Phone		H	
Fax	(616)931-3970	Fax		I	
e-Mail Address	Blaine.Utteral@eesolutions.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4089	11/14	2:48pm	Sand		1	X	X									
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☒ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell | Date: 11/14 | Time: 1550 | Received by: Darcel Rush

Relinquished by: | Date: | Time: | Received by (Laboratory):

Logged by (Laboratory): NJF | Date: 11-14-17 | Time: 1610 | Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	3.2

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Jamie DeYoung CAP

Antimony

Arsenic

Barium

Beryllium

Boron

Cadmium

Chromium

Cobalt

Lead

Lithium

Mercury

Molybdenum

Selenium

Thallium

Sulfate

Fluoride

Chloride

Radium 226 & 228 Combined – hold off, will call

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **14-Nov-17 15:50**

Work Order: **1711988** Received by: **NCF**

Checklist completed by Nicole Fredericks (eSignature) 14-Nov-17 (Date) Reviewed by: Bill Carey (eSignature) 15-Nov-17 (Date)

Matrices: Solid

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):	3.2/3.2	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/14/20174:15:03 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:

16-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **1711667**

Dear Blaine,

ALS Environmental received 1 sample on 09-Nov-2017 02:36 PM 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 industry accepted practices and Quality Control 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 10.

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

Report of Laboratory Analysis

ALS Group, USA

Date: 16-Nov-17

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **1711667**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1711667-01	4096	Solid		11/9/2017 13:35	11/9/2017 14:36	☐

ALS Group, USA

Date: 16-Nov-17

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **1711667**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *16-Nov-17*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1711667
Sample ID: 4096
Lab ID: 1711667-01
Collection Date: 11/9/2017 01:35 PM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/13/17 14:40		Analyst: **RSH**
Mercury	**0.029**		**0.019**	**mg/Kg-dry**	1	11/13/2017 10:01 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/14/17 12:20		Analyst: **JF**
Antimony	ND		0.14	mg/Kg-dry	1	11/14/2017 06:38 PM
Arsenic	**17**		**0.056**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Barium	**25**		**0.47**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Beryllium	**0.43**		**0.19**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Boron	**3.4**		**1.9**	**mg/Kg-dry**	1	11/15/2017 11:36 AM
Cadmium	**0.21**		**0.093**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Chromium	**6.7**		**0.47**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Cobalt	**3.3**		**0.23**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Lead	**7.7**		**0.47**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Lithium	**4.9**		**0.19**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Molybdenum	ND		0.47	mg/Kg-dry	1	11/14/2017 06:38 PM
Selenium	**1.5**		**0.093**	**mg/Kg-dry**	1	11/14/2017 06:38 PM
Thallium	ND		0.23	mg/Kg-dry	1	11/14/2017 06:38 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/14/17 18:00		Analyst: **EE**
Chloride	ND		24	mg/Kg-dry	2	11/15/2017 11:23 AM
Fluoride	ND		2.4	mg/Kg-dry	2	11/15/2017 11:23 AM
Sulfate	**2,100**		**610**	**mg/Kg-dry**	50	11/15/2017 11:42 AM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**20**		**0.050**	**% of sample**	1	11/13/2017 10:34 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **110475** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **mblk-110475-110475**				Units: **mg/Kg**			Analysis Date: **11/13/2017 09:14 P**			
Client ID:	Run ID: **HG1_171113A**				SeqNo: **4756705**			Prep Date: **11/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	ND	0.020									

LCS	Sample ID: **lcs-110475-110475**				Units: **mg/Kg**			Analysis Date: **11/13/2017 09:17 P**			
Client ID:	Run ID: **HG1_171113A**				SeqNo: **4756706**			Prep Date: **11/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1717	0.020	0.1665	0	103	80-120	0				

MS	Sample ID: **1711671-01ams**				Units: **mg/Kg**			Analysis Date: **11/13/2017 10:22 P**			
Client ID:	Run ID: **HG1_171113A**				SeqNo: **4756731**			Prep Date: **11/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.2507	0.017	0.1388	0	181	75-125	0			S	

MSD	Sample ID: **1711671-01amsd**				Units: **mg/Kg**			Analysis Date: **11/13/2017 10:24 P**			
Client ID:	Run ID: **HG1_171113A**				SeqNo: **4756732**			Prep Date: **11/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.2406	0.017	0.1397	0	172	75-125	0			S	

The following samples were analyzed in this batch: 1711667-01a

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711667
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **110528** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-110528-110528** Units: **mg/Kg** Analysis Date: **11/14/2017 06:35 P**
Client ID: Run ID: **ICPMS3_171114A** SeqNo: **4759963** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.00855	0.25								J
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	0.00305	0.10								J
Cadmium	0.0023	0.10								J
Chromium	0.2196	0.25								J
Cobalt	ND	0.25								
Lead	0.00715	0.25								J
Lithium	ND	0.50								
Molybdenum	0.04815	0.25								J
Selenium	ND	0.25								
Thallium	0.0037	0.25								J

MBLK Sample ID: **MBLK-110528-110528** Units: **mg/L** Analysis Date: **11/15/2017 11:35 A**
Client ID: Run ID: **ICPMS3_171115A** SeqNo: **4761013** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Boron	ND	1.0								

LCS Sample ID: **LCS-110528-110528** Units: **mg/Kg** Analysis Date: **11/14/2017 06:36 P**
Client ID: Run ID: **ICPMS3_171114A** SeqNo: **4759964** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	5.01	0.25	5	0	100	80-120	0			
Arsenic	5.07	0.25	5	0	101	80-120	0			
Barium	5.143	0.25	5	0	103	80-120	0			
Beryllium	5.271	0.10	5	0	105	80-120	0			
Boron	25.15	1.0	25	0	101	80-120	0			
Cadmium	5.194	0.10	5	0	104	80-120	0			
Chromium	5.281	0.25	5	0	106	80-120	0			
Cobalt	5.195	0.25	5	0	104	80-120	0			
Lead	5.207	0.25	5	0	104	80-120	0			
Lithium	5.295	0.50	5	0	106	80-120	0			
Molybdenum	5.386	0.25	5	0	108	80-120	0			
Selenium	5.125	0.25	5	0	102	80-120	0			
Thallium	5.197	0.25	5	0	104	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711667
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **110528** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1711792-06AMS** Units: **mg/Kg** Analysis Date: **11/14/2017 07:10 P**

Client ID: Run ID: **ICPMS3_171114A** SeqNo: **4759985** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.379	0.33	6.667	0.02324	95.3	75-125	0			
Arsenic	7.197	0.33	6.667	0.6929	97.6	75-125	0			
Barium	10.2	0.33	6.667	2.311	118	75-125	0			
Beryllium	6.89	0.13	6.667	0.03682	103	75-125	0			
Boron	32.92	1.3	33.33	-0.5063	100	75-125	0			
Cadmium	6.556	0.13	6.667	0.01605	98.1	75-125	0			
Chromium	9.235	0.33	6.667	2.291	104	75-125	0			
Cobalt	6.982	0.33	6.667	0.6294	95.3	75-125	0			
Lead	8.862	0.33	6.667	2.194	100	75-125	0			
Lithium	7.797	0.67	6.667	0.5467	109	75-125	0			
Molybdenum	6.902	0.33	6.667	0.05513	103	75-125	0			
Selenium	6.469	0.33	6.667	0.5246	89.2	75-125	0			
Thallium	6.749	0.33	6.667	0.00466	101	75-125	0			

MSD Sample ID: **1711792-06AMSD** Units: **mg/Kg** Analysis Date: **11/14/2017 07:11 P**

Client ID: Run ID: **ICPMS3_171114A** SeqNo: **4759986** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.263	0.33	6.649	0.02324	93.8	75-125	6.379	1.84	20	
Arsenic	7.037	0.33	6.649	0.6929	95.4	75-125	7.197	2.26	20	
Barium	10.24	0.33	6.649	2.311	119	75-125	10.2	0.353	20	
Beryllium	6.893	0.13	6.649	0.03682	103	75-125	6.89	0.0506	20	
Boron	33.22	1.3	33.24	-0.5063	101	75-125	32.92	0.894	20	
Cadmium	6.525	0.13	6.649	0.01605	97.9	75-125	6.556	0.477	20	
Chromium	9.048	0.33	6.649	2.291	102	75-125	9.235	2.04	20	
Cobalt	6.96	0.33	6.649	0.6294	95.2	75-125	6.982	0.324	20	
Lead	8.752	0.33	6.649	2.194	98.6	75-125	8.862	1.25	20	
Lithium	7.78	0.66	6.649	0.5467	109	75-125	7.797	0.228	20	
Molybdenum	6.943	0.33	6.649	0.05513	104	75-125	6.902	0.599	20	
Selenium	6.692	0.33	6.649	0.5246	92.8	75-125	6.469	3.39	20	
Thallium	6.691	0.33	6.649	0.00466	101	75-125	6.749	0.861	20	

The following samples were analyzed in this batch: 1711667-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711667
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **110610** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-110610-110610** Units: **mg/Kg** Analysis Date: **11/15/2017 09:45 A**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761517** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2.926	10								J
Fluoride	ND	1.0								
Sulfate	2.174	10								J

LCS Sample ID: **LCS-110610-110610** Units: **mg/Kg** Analysis Date: **11/15/2017 07:59 A**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761516** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	93.97	10	100	0	94	80-120	0			
Fluoride	20.97	1.0	20	0	105	80-120	0			
Sulfate	97.19	10	100	0	97.2	80-120	0			

MS Sample ID: **1711923-01A MS** Units: **mg/Kg** Analysis Date: **11/15/2017 12:01 P**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761523** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	91.64	9.7	97.09	5.947	88.3	75-125	0			
Fluoride	19.59	0.97	19.42	0	101	75-125	0			
Sulfate	132.3	9.7	97.09	37.85	97.2	75-125	0			

MSD Sample ID: **1711923-01A MSD** Units: **mg/Kg** Analysis Date: **11/15/2017 12:20 P**
Client ID: Run ID: **IC3_171115A** SeqNo: **4761524** Prep Date: **11/14/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	92.68	9.9	99.4	5.947	87.3	75-125	91.64	1.14	20	
Fluoride	19.94	0.99	19.88	0	100	75-125	19.59	1.73	20	
Sulfate	131.6	9.9	99.4	37.85	94.3	75-125	132.3	0.5	20	

The following samples were analyzed in this batch: 1711667-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1711667
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R224465** Instrument ID **MOIST** Method: **SW3550C**

MBLK	Sample ID: **WBLKS-R224465**				Units: **% of sample**			Analysis Date: **11/13/2017 10:34 A**		
Client ID:	Run ID: **MOIST_171113B**				SeqNo: **4756883**			Prep Date:		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS	Sample ID: **LCS-R224465**				Units: **% of sample**			Analysis Date: **11/13/2017 10:34 A**		
Client ID:	Run ID: **MOIST_171113B**				SeqNo: **4756882**			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: **1711657-08B DUP**				Units: **% of sample**			Analysis Date: **11/13/2017 10:34 A**		
Client ID:	Run ID: **MOIST_171113B**				SeqNo: **4756862**			Prep Date:		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	4.6	0.050	0	0	0	0-0	4.4	4.44	5	

DUP	Sample ID: **1711657-09B DUP**				Units: **% of sample**			Analysis Date: **11/13/2017 10:34 A**		
Client ID:	Run ID: **MOIST_171113B**				SeqNo: **4756864**			Prep Date:		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	4.35	0.050	0	0	0	0-0	4.45	2.27	5	

The following samples were analyzed in this batch: 1711667-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **09-Nov-17 14:36**

Work Order: **1711667** Received by: **NCF**

Checklist completed by Nicole Fredericks (eSignature) 09-Nov-17 (Date) Reviewed by: Chad Whelton (eSignature) 09-Nov-17 (Date)

Matrices: Solid

Carrier name: Client

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):	5.2/5.2	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/9/20172:42:08 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:

20-Nov-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYound CYAP (133-17-001)** Work Order: **1711571**

Dear Blaine, Revision: **1**

ALS Environmental received 2 samples on 08-Nov-2017 03:10 PM 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 industry accepted practices and Quality Control 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 12.

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

ALS Group, USA

Date: 20-Nov-17

Client: Engineering & Environmental Solutions
Project: James DeYound CYAP (133-17-001)
Work Order: **1711571**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1711571-01	4025	Solid		11/8/2017 13:04	11/8/2017 15:10	☐
1711571-02	4009	Solid		11/8/2017 13:06	11/8/2017 15:10	☐

ALS Group, USA

Date: 20-Nov-17

Client: Engineering & Environmental Solutions
Project: James DeYound CYAP (133-17-001)
WorkOrder: **1711571**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

ALS Group, USA

Date: *20-Nov-17*

Client: Engineering & Environmental Solutions
Project: James DeYound CYAP (133-17-001)
Work Order: 1711571
Sample ID: 4025
Lab ID: 1711571-01
Collection Date: 11/8/2017 01:04 PM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/9/17 14:35		Analyst: **RSH**
Mercury	**0.041**		**0.024**	**mg/Kg-dry**	1	11/9/2017 04:17 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/9/17 11:13		Analyst: **JF**
Antimony	**0.24**		**0.15**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Arsenic	**4.4**		**0.059**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Barium	**19**		**0.49**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Beryllium	**2.7**		**0.20**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Boron	**3.9**		**2.0**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Cadmium	ND		0.98	mg/Kg-dry	10	11/9/2017 01:32 PM
Chromium	**2.4**		**0.49**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Cobalt	**50**		**0.25**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Lead	**7.2**		**0.49**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Lithium	**5.6**		**0.20**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Molybdenum	ND		4.9	mg/Kg-dry	10	11/9/2017 01:32 PM
Selenium	**1.4**		**0.098**	**mg/Kg-dry**	1	11/9/2017 01:18 PM
Thallium	ND		0.25	mg/Kg-dry	1	11/9/2017 01:18 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 11/17/17 12:31		Analyst: **JF**
Cobalt	**0.0097**		**0.0050**	**mg/L**	1	11/17/2017 07:04 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/9/17 10:30		Analyst: **EE**
Chloride	ND		12	mg/Kg-dry	1	11/9/2017 01:29 PM
Fluoride	**1.3**		**1.2**	**mg/Kg-dry**	1	11/9/2017 01:29 PM
Sulfate	**73**		**12**	**mg/Kg-dry**	1	11/9/2017 01:29 PM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**21**		**0.050**	**% of sample**	1	11/9/2017 10:50 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *20-Nov-17*

Client: Engineering & Environmental Solutions
Project: James DeYound CYAP (133-17-001)
Work Order: 1711571
Sample ID: 4009
Lab ID: 1711571-02
Collection Date: 11/8/2017 01:06 PM
Matrix: SOLID

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 11/9/17 14:35		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	11/9/2017 04:19 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 11/9/17 11:13		Analyst: **JF**
Antimony	ND		0.13	mg/Kg-dry	1	11/9/2017 01:25 PM
Arsenic	**4.1**		**0.050**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Barium	**7.0**		**0.42**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Beryllium	ND		0.17	mg/Kg-dry	1	11/9/2017 01:25 PM
Boron	**1.9**		**1.7**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Cadmium	**0.12**		**0.084**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Chromium	**2.0**		**0.42**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Cobalt	**1.1**		**0.21**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Lead	**1.3**		**0.42**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Lithium	**4.4**		**0.17**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Molybdenum	**1.1**		**0.42**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Selenium	**0.56**		**0.084**	**mg/Kg-dry**	1	11/9/2017 01:25 PM
Thallium	ND		0.21	mg/Kg-dry	1	11/9/2017 01:25 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 11/9/17 10:30		Analyst: **EE**
Chloride	ND		11	mg/Kg-dry	1	11/9/2017 02:26 PM
Fluoride	ND		1.1	mg/Kg-dry	1	11/9/2017 02:26 PM
Sulfate	**51**		**11**	**mg/Kg-dry**	1	11/9/2017 02:26 PM
MOISTURE			**SW3550C**			Analyst: **MT**
Moisture	**14**		**0.050**	**% of sample**	1	11/9/2017 10:50 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

QC BATCH REPORT

Batch ID: **110335** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-110335-110335**				Units: **mg/Kg**			Analysis Date: **11/9/2017 03:30 PM**			
Client ID:	Run ID: **HG1_171109A**				SeqNo: **4751128**			Prep Date: **11/9/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-110335-110335**				Units: **mg/Kg**			Analysis Date: **11/9/2017 03:32 PM**			
Client ID:	Run ID: **HG1_171109A**				SeqNo: **4751129**			Prep Date: **11/9/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.16	0.020	0.1665	0	96.1	80-120	0			

MS	Sample ID: **1711232-02AMS**				Units: **mg/Kg**			Analysis Date: **11/9/2017 04:09 PM**			
Client ID:	Run ID: **HG1_171109A**				SeqNo: **4751143**			Prep Date: **11/9/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1613	0.017	0.1401	0.009384	108	75-125	0			

MSD	Sample ID: **1711232-02AMSD**				Units: **mg/Kg**			Analysis Date: **11/9/2017 04:12 PM**			
Client ID:	Run ID: **HG1_171109A**				SeqNo: **4751144**			Prep Date: **11/9/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1592	0.017	0.1395	0.009384	107	75-125	0.1613	1.29	35	

The following samples were analyzed in this batch: 1711571-01A 1711571-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

QC BATCH REPORT

Batch ID: **110314** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-110314-110314** Units: **mg/Kg** Analysis Date: **11/9/2017 01:14 PM**
Client ID: Run ID: **ICPMS3_171109A** SeqNo: **4750792** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.25								
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.128	1.0								J
Cadmium	ND	0.10								
Chromium	0.06355	0.25								J
Cobalt	ND	0.25								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								
Thallium	ND	0.25								

LCS Sample ID: **LCS-110314-110314** Units: **mg/Kg** Analysis Date: **11/9/2017 01:15 PM**
Client ID: Run ID: **ICPMS3_171109A** SeqNo: **4750793** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	5.06	0.25	5	0	101	80-120	0			
Arsenic	4.998	0.25	5	0	100	80-120	0			
Barium	5.21	0.25	5	0	104	80-120	0			
Beryllium	4.779	0.10	5	0	95.6	80-120	0			
Boron	23.8	1.0	25	0	95.2	80-120	0			
Cadmium	5.03	0.10	5	0	101	80-120	0			
Chromium	5.085	0.25	5	0	102	80-120	0			
Cobalt	5.121	0.25	5	0	102	80-120	0			
Lead	5.053	0.25	5	0	101	80-120	0			
Lithium	4.93	0.50	5	0	98.6	80-120	0			
Molybdenum	5.161	0.25	5	0	103	80-120	0			
Selenium	5	0.25	5	0	100	80-120	0			
Thallium	5.066	0.25	5	0	101	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1711571
Project: James DeYound CYAP (133-17-001)

QC BATCH REPORT

Batch ID: **110314** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **1711571-02AMS** Units: **mg/Kg** Analysis Date: **11/9/2017 01:26 PM**
Client ID: **4009** Run ID: **ICPMS3_171109A** SeqNo: **4750800** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.709	0.36	7.205	0.02095	92.8	75-125	0			
Arsenic	10.01	0.36	7.205	3.525	90	75-125	0			
Barium	13.97	0.36	7.205	5.976	111	75-125	0			
Beryllium	7.167	0.14	7.205	0.1124	97.9	75-125	0			
Boron	36.65	1.4	36.02	1.656	97.1	75-125	0			
Cadmium	6.804	0.14	7.205	0.09935	93.1	75-125	0			
Chromium	9.244	0.36	7.205	1.742	104	75-125	0			
Cobalt	7.665	0.36	7.205	0.9803	92.8	75-125	0			
Lead	8.161	0.36	7.205	1.123	97.7	75-125	0			
Lithium	11.65	0.72	7.205	3.814	109	75-125	0			
Molybdenum	7.839	0.36	7.205	0.9657	95.4	75-125	0			
Selenium	7.268	0.36	7.205	0.4803	94.2	75-125	0			
Thallium	7.231	0.36	7.205	0.02522	100	75-125	0			

MSD Sample ID: **1711571-02AMSD** Units: **mg/Kg** Analysis Date: **11/9/2017 01:28 PM**
Client ID: **4009** Run ID: **ICPMS3_171109A** SeqNo: **4750801** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.737	0.36	7.225	0.02095	92.9	75-125	6.709	0.403	20	
Arsenic	10.71	0.36	7.225	3.525	99.4	75-125	10.01	6.71	20	
Barium	16.12	0.36	7.225	5.976	140	75-125	13.97	14.3	20	S
Beryllium	7.021	0.14	7.225	0.1124	95.6	75-125	7.167	2.06	20	
Boron	36.41	1.4	36.13	1.656	96.2	75-125	36.65	0.659	20	
Cadmium	6.794	0.14	7.225	0.09935	92.6	75-125	6.804	0.153	20	
Chromium	8.877	0.36	7.225	1.742	98.7	75-125	9.244	4.05	20	
Cobalt	7.767	0.36	7.225	0.9803	93.9	75-125	7.665	1.32	20	
Lead	8.471	0.36	7.225	1.123	102	75-125	8.161	3.72	20	
Lithium	12.02	0.72	7.225	3.814	114	75-125	11.65	3.08	20	
Molybdenum	8.169	0.36	7.225	0.9657	99.7	75-125	7.839	4.12	20	
Selenium	7.075	0.36	7.225	0.4803	91.3	75-125	7.268	2.68	20	
Thallium	7.282	0.36	7.225	0.02522	100	75-125	7.231	0.692	20	

The following samples were analyzed in this batch: 1711571-01A 1711571-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1711571
Project: James DeYound CYAP (133-17-001)

QC BATCH REPORT

Batch ID: **110361** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-110361-110361** Units: **mg/Kg** Analysis Date: **11/9/2017 10:55 AM**
Client ID: Run ID: **IC4_171109A** SeqNo: **4751111** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	10								
Fluoride	ND	1.0								
Sulfate	ND	10								

LCS Sample ID: **LCS-110361-110361** Units: **mg/Kg** Analysis Date: **11/9/2017 10:34 AM**
Client ID: Run ID: **IC4_171109A** SeqNo: **4751110** Prep Date: **11/9/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	90.89	10	100	0	90.9	80-120	0			
Fluoride	19.41	1.0	20	0	97	80-120	0			
Sulfate	94.55	10	100	0	94.6	80-120	0			

MS Sample ID: **1711448-01A MS** Units: **mg/Kg** Analysis Date: **11/9/2017 11:53 AM**
Client ID: Run ID: **IC4_171109A** SeqNo: **4751114** Prep Date: **11/9/2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	142.1	49	98.62	62.82	80.4	75-125	0			
Fluoride	14.04	4.9	19.72	0	71.2	75-125	0			S
Sulfate	462.9	49	98.62	396.8	67	75-125	0			SO

MSD Sample ID: **1711448-01A MSD** Units: **mg/Kg** Analysis Date: **11/9/2017 12:12 PM**
Client ID: Run ID: **IC4_171109A** SeqNo: **4751115** Prep Date: **11/9/2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	132.2	49	97.28	62.82	71.4	75-125	142.1	7.2	20	S
Fluoride	13.88	4.9	19.46	0	71.4	75-125	14.04	1.13	20	S
Sulfate	460.1	49	97.28	396.8	65	75-125	462.9	0.611	20	SO

The following samples were analyzed in this batch: 1711571-01A 1711571-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1711571
Project: James DeYound CYAP (133-17-001)

QC BATCH REPORT

Batch ID: **R224251** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R224251** Units: **% of sample** Analysis Date: **11/9/2017 10:50 AM**
Client ID: Run ID: **MOIST_171109A** SeqNo: **4751849** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R224251** Units: **% of sample** Analysis Date: **11/9/2017 10:50 AM**
Client ID: Run ID: **MOIST_171109A** SeqNo: **4751848** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.99	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1711571-01A DUP** Units: **% of sample** Analysis Date: **11/9/2017 10:50 AM**
Client ID: **4025** Run ID: **MOIST_171109A** SeqNo: **4751843** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	22.19	0.050	0	0	0	0-0	21.03	5.37	5	R

DUP Sample ID: **1711571-02A DUP** Units: **% of sample** Analysis Date: **11/9/2017 10:50 AM**
Client ID: **4009** Run ID: **MOIST_171109A** SeqNo: **4751845** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	12.91	0.050	0	0	0	0-0	14.14	9.09	5	R

The following samples were analyzed in this batch: 1711571-01A 1711571-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

+1 513 733 5336 Everett, WA +1 425 356 2600
+1 970 490 1511 Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 38932

ALS Project Manager: | ALS Work Order #: 1711571

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CYAP	A	Metals (listed)
Work Order		Project Number	133-17-001	B	
Company Name	Engineering + Environmental Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn		D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	(616) 931-3967	Phone		H	
Fax	(616) 931-3970	Fax		I	
e-Mail Address	blaine.litteral@goecsolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4025	11/8	1:09 pm	Sand		1	X										
2	4009	11/8	1:06 pm	Sand		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ Other ____ ☐ 10 BD ☐ 5 BD ☐ 3 BD ☒ 2 BD ☐ 1 BD

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell	11-8-17	1510	Nicole Freel
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory): NJF	Date: 11-8-17	Time: 1525	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	3.2

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **08-Nov-17 15:10**

Work Order: **1711571** Received by: **NCF**

Checklist completed by Nicole Fredericks (eSignature) 08-Nov-17 (Date) Reviewed by: Chad Whelton (eSignature) 09-Nov-17 (Date)

Matrices: Solid

Carrier name: Client

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):	3.2/3.2	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	11/8/20173:26:54 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:

20-Apr-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **1804896**

Dear Blaine,

ALS Environmental received 1 sample on 16-Apr-2018 12:06 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 20-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **1804896**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1804896-01	4164	Soil		4/16/2018 11:15	4/16/2018 12:06	☐

ALS Group, USA

Date: 20-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **1804896**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *20-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1804896
Sample ID: 4164
Lab ID: 1804896-01
Collection Date: 4/16/2018 11:15 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/19/18 13:56		Analyst: **RSH**
Mercury	**0.023**		**0.021**	**mg/Kg-dry**	1	4/20/2018 02:59 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/16/18 14:47		Analyst: **JF**
Arsenic	**1.9**		**0.049**	**mg/Kg-dry**	1	4/16/2018 06:57 PM
Barium	**18**		**0.41**	**mg/Kg-dry**	1	4/16/2018 06:57 PM
Beryllium	ND		0.16	mg/Kg-dry	1	4/16/2018 06:57 PM
Boron	ND		1.6	mg/Kg-dry	1	4/16/2018 06:57 PM
Cadmium	ND		0.082	mg/Kg-dry	1	4/16/2018 06:57 PM
Lead	**7.3**		**0.41**	**mg/Kg-dry**	1	4/16/2018 06:57 PM
Lithium	**1.9**		**0.16**	**mg/Kg-dry**	1	4/16/2018 06:57 PM
Molybdenum	ND		0.41	mg/Kg-dry	1	4/16/2018 06:57 PM
Selenium	**0.81**		**0.082**	**mg/Kg-dry**	1	4/16/2018 06:57 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/17/18 11:00		Analyst: **EE**
Sulfate	ND		11	mg/Kg-dry	1	4/17/2018 12:15 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**12**		**0.050**	**% of sample**	1	4/17/2018 12:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 20-Apr-18

Client: Engineering & Environmental Solutions

Work Order: 1804896

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117094** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-117094-117094** Units: **mg/Kg** Analysis Date: **4/20/2018 10:32 AM**

Client ID: Run ID: **HG1_180420A** SeqNo: **4991974** Prep Date: **4/19/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

MBLK Sample ID: **MBLK-117094-117094** Units: **mg/Kg** Analysis Date: **4/20/2018 10:32 AM**

Client ID: Run ID: **HG1_180420A** SeqNo: **4991979** Prep Date: **4/19/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-117094-117094** Units: **mg/Kg** Analysis Date: **4/20/2018 11:08 AM**

Client ID: Run ID: **HG1_180420A** SeqNo: **4991989** Prep Date: **4/19/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1675	0.020	0.1665	0	101	80-120	0			

MS Sample ID: **1804896-01AMS** Units: **mg/Kg** Analysis Date: **4/20/2018 03:04 PM**

Client ID: **4164** Run ID: **HG1_180420B** SeqNo: **4992063** Prep Date: **4/19/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1523	0.019	0.1561	0.01995	84.8	75-125	0			

MSD Sample ID: **1804896-01AMSD** Units: **mg/Kg** Analysis Date: **4/20/2018 03:07 PM**

Client ID: **4164** Run ID: **HG1_180420B** SeqNo: **4992064** Prep Date: **4/19/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1545	0.019	0.1551	0.01995	86.7	75-125	0.1523	1.41	35	

The following samples were analyzed in this batch: 1804896-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1804896
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **116893** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-116893-116893** Units: **mg/Kg** Analysis Date: **4/16/2018 06:45 PM**
Client ID: Run ID: **ICPMS3_180416A** SeqNo: **4983839** Prep Date: **4/16/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	ND	1.0								
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-116893-116893** Units: **mg/Kg** Analysis Date: **4/16/2018 06:47 PM**
Client ID: Run ID: **ICPMS3_180416A** SeqNo: **4983840** Prep Date: **4/16/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.782	0.25	5	0	95.6	80-120	0			
Barium	4.729	0.25	5	0	94.6	80-120	0			
Beryllium	4.707	0.10	5	0	94.1	80-120	0			
Boron	23.63	1.0	25	0	94.5	80-120	0			
Cadmium	4.748	0.10	5	0	95	80-120	0			
Lead	5.023	0.25	5	0	100	80-120	0			
Lithium	4.949	0.50	5	0	99	80-120	0			
Molybdenum	5.027	0.25	5	0	101	80-120	0			
Selenium	4.599	0.25	5	0	92	80-120	0			

MS Sample ID: **1804790-07AMS** Units: **mg/Kg** Analysis Date: **4/16/2018 07:07 PM**
Client ID: Run ID: **ICPMS3_180416A** SeqNo: **4983852** Prep Date: **4/16/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.26	0.39	7.825	0.8252	95	75-125	0			
Barium	15.02	0.39	7.825	5.813	118	75-125	0			
Beryllium	7.746	0.16	7.825	0.06332	98.2	75-125	0			
Boron	40.06	1.6	39.12	0.4344	101	75-125	0			
Cadmium	7.139	0.16	7.825	-0.001803	91.3	75-125	0			
Lead	9.602	0.39	7.825	1.604	102	75-125	0			
Lithium	10.33	0.78	7.825	1.559	112	75-125	0			
Molybdenum	7.703	0.39	7.825	0.05776	97.7	75-125	0			
Selenium	7.435	0.39	7.825	0.4401	89.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1804896
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **116893** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **1804790-07AMSD** Units: **mg/Kg** Analysis Date: **4/16/2018 07:09 PM**

Client ID: Run ID: **ICPMS3_180416A** SeqNo: **4983853** Prep Date: **4/16/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.39	0.39	7.862	0.8252	96.2	75-125	8.26	1.56	20	
Barium	15.22	0.39	7.862	5.813	120	75-125	15.02	1.38	20	
Beryllium	7.731	0.16	7.862	0.06332	97.5	75-125	7.746	0.195	20	
Boron	39.77	1.6	39.31	0.4344	100	75-125	40.06	0.732	20	
Cadmium	7.156	0.16	7.862	-0.001803	91	75-125	7.139	0.237	20	
Lead	9.552	0.39	7.862	1.604	101	75-125	9.602	0.531	20	
Lithium	10.69	0.79	7.862	1.559	116	75-125	10.33	3.38	20	
Molybdenum	7.762	0.39	7.862	0.05776	98	75-125	7.703	0.752	20	
Selenium	7.389	0.39	7.862	0.4401	88.4	75-125	7.435	0.632	20	

The following samples were analyzed in this batch: 1804896-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1804896
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **116960** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-116960-116960** Units: **mg/Kg** Analysis Date: **4/17/2018 11:36 AM**
Client ID: Run ID: **IC3_180417A** SeqNo: **4984855** Prep Date: **4/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

LCS Sample ID: **LCS-116960-116960** Units: **mg/Kg** Analysis Date: **4/17/2018 11:17 AM**
Client ID: Run ID: **IC3_180417A** SeqNo: **4984854** Prep Date: **4/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	96.26	10	100	0	96.3	80-120	0			

MS Sample ID: **1804896-01A MS** Units: **mg/Kg** Analysis Date: **4/17/2018 12:34 PM**
Client ID: **4164** Run ID: **IC3_180417A** SeqNo: **4984858** Prep Date: **4/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	103.3	10	100	7.144	96.2	75-125	0			

MSD Sample ID: **1804896-01A MSD** Units: **mg/Kg** Analysis Date: **4/17/2018 12:53 PM**
Client ID: **4164** Run ID: **IC3_180417A** SeqNo: **4984859** Prep Date: **4/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	96.45	9.8	98.43	7.144	90.7	75-125	103.3	6.86	20	

The following samples were analyzed in this batch: 1804896-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1804896
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R233942** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **MB-R233942-R233942** Units: **% of sample** Analysis Date: **4/17/2018 12:30 PM**
Client ID: Run ID: **MOIST_180417A** SeqNo: **4985372** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R233942-R233942** Units: **% of sample** Analysis Date: **4/17/2018 12:30 PM**
Client ID: Run ID: **MOIST_180417A** SeqNo: **4985373** 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: **1804896-01A DUP** Units: **% of sample** Analysis Date: **4/17/2018 12:30 PM**
Client ID: **4164** Run ID: **MOIST_180417A** SeqNo: **4985375** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.26	0.050	0	0	0	0-0	12.24	8.34	10	

The following samples were analyzed in this batch: 1804896-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39474

ALS Project Manager: | ALS Work Order #: 1804896

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CAP	A	See attached
Work Order		Project Number	133-17-00	B	
Company Name	Engineering + environmental Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Lifford	Invoice Attn	Judy Voscher	D	
Address	400 16th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	(616)393-3967	Phone		H	
Fax		Fax		I	
e-Mail Address	Blaine.Lifford@eesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4146	4/16/18	11:15am	Soil		1											
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 4/16/18	Time: 11:45pm	Received by:
Relinquished by: —	Date: 4/16/18	Time: 1206	Received by (Laboratory):
Logged by (Laboratory): DFS	Date: 4/16/18	Time: 1245	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	18.0c

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

current cleanup criterion, we did see sulfate in the groundwater sample from monitoring well 3 that was above the secondary MCL for sulfate).

So the revised verification soil testing parameter list is the following:

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

One other suggestion was that as additional back up information that we may want to collect a soil sample (stored in a zip lock bag) at each grid interval so we would have this should it be necessary to help support the photographic and written descriptions of soil observations at each grid interval, especially for those not selected for collection of analytical samples.

They requested that we pull together a document similar to the one developed for the coal yard (copy attached) that summarizes what we will be doing to document the ash removal. I will develop a draft on Monday for internal review.

Hope everyone is having a nice Easter weekend.

Best,

Brad

Brad Venman

NTH Consultants, Ltd.

Direct: (517) 702-2956

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **16-Apr-18 12:06**

Work Order: **1804896** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 16-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 16-Apr-18 (Date)

Matrices: Soil

Carrier name: Client

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):	18.0/18.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/16/2018 12:46:45 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:

23-Apr-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18041231**

Dear Blaine,

ALS Environmental received 1 sample on 20-Apr-2018 11:50 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 23-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18041231**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18041231-01	196 Retest	Soil		4/20/2018 11:15	4/20/2018 11:50	☐

ALS Group, USA

Date: 23-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18041231**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *23-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041231
Sample ID: 196 Retest
Lab ID: 18041231-01
Collection Date: 4/20/2018 11:15 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/22/18 19:37		Analyst: **RSH**
Mercury	ND		0.025	mg/Kg-dry	1	4/23/2018 09:42 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/20/18 12:20		Analyst: **JF**
Arsenic	**2.7**		**0.049**	**mg/Kg-dry**	1	4/20/2018 05:25 PM
Barium	**7.8**		**0.41**	**mg/Kg-dry**	1	4/20/2018 05:25 PM
Beryllium	ND		0.16	mg/Kg-dry	1	4/20/2018 05:25 PM
Boron	ND		1.6	mg/Kg-dry	1	4/20/2018 05:25 PM
Cadmium	ND		0.082	mg/Kg-dry	1	4/20/2018 05:25 PM
Lead	**0.95**		**0.41**	**mg/Kg-dry**	1	4/20/2018 05:25 PM
Lithium	**1.4**		**0.16**	**mg/Kg-dry**	1	4/20/2018 05:25 PM
Molybdenum	ND		0.41	mg/Kg-dry	1	4/20/2018 05:25 PM
Selenium	**0.27**		**0.082**	**mg/Kg-dry**	1	4/20/2018 05:25 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/22/18 14:32		Analyst: **EE**
Sulfate	**430**		**25**	**mg/Kg-dry**	2	4/23/2018 11:38 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**22**		**0.050**	**% of sample**	1	4/20/2018 03:35 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 23-Apr-18

Client: Engineering & Environmental Solutions

Work Order: 18041231

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117186** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-117186-117186**			Units: **mg/Kg**			Analysis Date: **4/23/2018 09:34 AM**			
Client ID:	Run ID: **HG1_180423A**			SeqNo: **4993946**			Prep Date: **4/22/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-117186-117186**			Units: **mg/Kg**			Analysis Date: **4/23/2018 10:04 AM**			
Client ID:	Run ID: **HG1_180423A**			SeqNo: **4993953**			Prep Date: **4/22/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1517	0.020	0.1665	0	91.1	80-120	0			

MS	Sample ID: **18041282-01AMS**			Units: **mg/Kg**			Analysis Date: **4/23/2018 10:07 AM**			
Client ID:	Run ID: **HG1_180423A**			SeqNo: **4993954**			Prep Date: **4/22/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1351	0.016	0.135	-0.001078	101	75-125	0			

MSD	Sample ID: **18041282-01AMSD**			Units: **mg/Kg**			Analysis Date: **4/23/2018 10:09 AM**			
Client ID:	Run ID: **HG1_180423A**			SeqNo: **4993955**			Prep Date: **4/22/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1353	0.016	0.1345	-0.001078	101	75-125	0.1351	0.0942	35	

The following samples were analyzed in this batch: 18041231-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041231
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117135** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117135-117135** Units: **mg/Kg** Analysis Date: **4/20/2018 04:37 PM**
Client ID: Run ID: **ICPMS3_180420A** SeqNo: **4993296** Prep Date: **4/20/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.236	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117135-117135** Units: **mg/Kg** Analysis Date: **4/20/2018 04:39 PM**
Client ID: Run ID: **ICPMS3_180420A** SeqNo: **4993297** Prep Date: **4/20/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.845	0.25	5	0	96.9	80-120	0			
Barium	4.864	0.25	5	0	97.3	80-120	0			
Boron	22.57	1.0	25	0	90.3	80-120	0			
Cadmium	4.712	0.10	5	0	94.2	80-120	0			
Lead	4.958	0.25	5	0	99.2	80-120	0			
Lithium	4.856	0.50	5	0	97.1	80-120	0			
Molybdenum	4.817	0.25	5	0	96.3	80-120	0			
Selenium	4.575	0.25	5	0	91.5	80-120	0			

LCS Sample ID: **LCS-117135-117135** Units: **mg/Kg** Analysis Date: **4/23/2018 12:08 PM**
Client ID: Run ID: **ICPMS3_180423A** SeqNo: **4994342** Prep Date: **4/20/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.651	0.10	5	0	93	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041231
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117135** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **18041192-03AMS** Units: **mg/Kg** Analysis Date: **4/20/2018 04:45 PM**
Client ID: Run ID: **ICPMS3_180420A** SeqNo: **4993301** Prep Date: **4/20/2018** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.426	39	7.704	1.385	104	75-125	0			J
Barium	16.62	39	7.704	6.361	133	75-125	0			JS
Boron	50.56	150	38.52	18.62	82.9	75-125	0			J
Cadmium	7.739	15	7.704	0.1772	98.2	75-125	0			J
Lead	28.52	39	7.704	17.13	148	75-125	0			JS
Lithium	10.29	77	7.704	1.452	115	75-125	0			J
Molybdenum	13.96	39	7.704	4.582	122	75-125	0			J
Selenium	ND	39	7.704	0.3313	-4.3	75-125	0			S

MS Sample ID: **18041192-03AMS** Units: **mg/Kg** Analysis Date: **4/23/2018 12:14 PM**
Client ID: Run ID: **ICPMS3_180423A** SeqNo: **4994346** Prep Date: **4/20/2018** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.531	15	7.704	0.3155	93.7	75-125	0			J

MSD Sample ID: **18041192-03AMSD** Units: **mg/Kg** Analysis Date: **4/20/2018 04:47 PM**
Client ID: Run ID: **ICPMS3_180420A** SeqNo: **4993302** Prep Date: **4/20/2018** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.848	38	7.692	1.385	97	75-125	9.426	0	20	J
Barium	19.75	38	7.692	6.361	174	75-125	16.62	0	20	JS
Boron	49.28	150	38.46	18.62	79.7	75-125	50.56	0	20	J
Cadmium	7.582	15	7.692	0.1772	96.3	75-125	7.739	0	20	J
Lead	39.29	38	7.692	17.13	288	75-125	28.52	31.8	20	SR
Lithium	10.06	77	7.692	1.452	112	75-125	10.29	0	20	J
Molybdenum	20.77	38	7.692	4.582	210	75-125	13.96	0	20	JS
Selenium	ND	38	7.692	0.3313	-4.31	75-125	7.276	0	20	S

MSD Sample ID: **18041192-03AMSD** Units: **mg/Kg** Analysis Date: **4/23/2018 12:15 PM**
Client ID: Run ID: **ICPMS3_180423A** SeqNo: **4994347** Prep Date: **4/20/2018** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	7.614	15	7.692	0.3155	94.9	75-125	7.531	0	20	J

The following samples were analyzed in this batch: 18041231-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041231
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117236** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-117236-117236** Units: **mg/Kg** Analysis Date: **4/23/2018 11:18 AM**
Client ID: Run ID: **IC4_180423A** SeqNo: **4994784** Prep Date: **4/22/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

LCS Sample ID: **LCS-117236-117236** Units: **mg/Kg** Analysis Date: **4/23/2018 10:59 AM**
Client ID: Run ID: **IC4_180423A** SeqNo: **4994781** Prep Date: **4/22/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	97.56	10	100	0	97.6	80-120	0			

MS Sample ID: **18041282-01A MS** Units: **mg/Kg** Analysis Date: **4/23/2018 12:16 PM**
Client ID: Run ID: **IC4_180423A** SeqNo: **4994791** Prep Date: **4/22/2018** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	95.26	19	96.9	2.909	95.3	75-125	0			

MSD Sample ID: **18041282-01A MSD** Units: **mg/Kg** Analysis Date: **4/23/2018 12:35 PM**
Client ID: Run ID: **IC4_180423A** SeqNo: **4994794** Prep Date: **4/22/2018** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	94.97	20	99.6	2.909	92.4	75-125	95.26	0.302	20	

The following samples were analyzed in this batch: 18041231-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041231
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R234299** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R234299** Units: **% of sample** Analysis Date: **4/20/2018 03:35 PM**
Client ID: Run ID: **MOIST_180420B** SeqNo: **4993643** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R234299** Units: **% of sample** Analysis Date: **4/20/2018 03:35 PM**
Client ID: Run ID: **MOIST_180420B** SeqNo: **4993642** 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: **18041152-04B DUP** Units: **% of sample** Analysis Date: **4/20/2018 03:35 PM**
Client ID: Run ID: **MOIST_180420B** SeqNo: **4993625** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.36	0.050	0	0	0	0-0	17.44	0.46	10	

DUP Sample ID: **18041189-08A DUP** Units: **% of sample** Analysis Date: **4/20/2018 03:35 PM**
Client ID: Run ID: **MOIST_180420B** SeqNo: **4993632** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	98.32	0.050	0	0	0	0-0	98.33	0.0102	10	

The following samples were analyzed in this batch: 18041231-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39476

ALS Project Manager: | ALS Work Order #: 1804123 1

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CYAP	A	see attached
Work Order		Project Number	133-17-0001	B	
Company Name	engineering & environmental solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	(616) 931-3767	Phone		H	
Fax		Fax		I	
e-Mail Address	Blaine.Litteral@goeersolutions.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	196 RB test	4/20/18	11:15am	Soil	SOK	1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 4/20/18	Time: 1150	Received by:	
Relinquished by:	Date: 4/20/18	Time: 1150	Received by (Laboratory):	
Logged by (Laboratory): DFS	Date: 4/20/18	Time: 1230	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
SR2	4.6°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **20-Apr-18 11:50**

Work Order: **18041231** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 20-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 20-Apr-18 (Date)

Matrices: Soil

Carrier name: Client

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):	4.6/4.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/20/2018 12:35:14 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:

24-Apr-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18041282**

Dear Blaine,

ALS Environmental received 1 sample on 20-Apr-2018 04:30 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 24-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18041282**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18041282-01	4151	Soil		4/20/2018 14:00	4/20/2018 16:30	☐

ALS Group, USA

Date: 24-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18041282**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
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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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *24-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041282
Sample ID: 4151
Lab ID: 18041282-01
Collection Date: 4/20/2018 02:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/22/18 19:37		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	4/23/2018 09:44 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/23/18 11:42		Analyst: **RH**
Arsenic	**0.63**		**0.050**	**mg/Kg-dry**	1	4/23/2018 12:35 PM
Barium	**5.6**		**0.41**	**mg/Kg-dry**	1	4/23/2018 12:35 PM
Beryllium	ND		0.17	mg/Kg-dry	1	4/23/2018 12:35 PM
Boron	ND		1.7	mg/Kg-dry	1	4/23/2018 12:35 PM
Cadmium	ND		0.083	mg/Kg-dry	1	4/23/2018 12:35 PM
Lead	**1.0**		**0.41**	**mg/Kg-dry**	1	4/23/2018 12:35 PM
Lithium	**1.8**		**0.17**	**mg/Kg-dry**	1	4/23/2018 12:35 PM
Molybdenum	**1.4**		**0.41**	**mg/Kg-dry**	1	4/23/2018 12:35 PM
Selenium	**0.30**		**0.083**	**mg/Kg-dry**	1	4/23/2018 12:35 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/22/18 14:32		Analyst: **EE**
Sulfate	ND		12	mg/Kg-dry	1	4/23/2018 11:57 AM
MOISTURE			**SW3550C**			Analyst: **RZM**
Moisture	**22**		**0.050**	**% of sample**	1	4/23/2018 04:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 24-Apr-18

Client: Engineering & Environmental Solutions

Work Order: 18041282

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117186** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-117186-117186** Units: **mg/Kg** Analysis Date: **4/23/2018 09:34 AM**

Client ID: Run ID: **HG1_180423A** SeqNo: **4993946** Prep Date: **4/22/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-117186-117186** Units: **mg/Kg** Analysis Date: **4/23/2018 10:04 AM**

Client ID: Run ID: **HG1_180423A** SeqNo: **4993953** Prep Date: **4/22/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1517	0.020	0.1665	0	91.1	80-120	0			

MS Sample ID: **18041282-01AMS** Units: **mg/Kg** Analysis Date: **4/23/2018 10:07 AM**

Client ID: **4151** Run ID: **HG1_180423A** SeqNo: **4993954** Prep Date: **4/22/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1351	0.016	0.135	-0.001078	101	75-125	0			

MSD Sample ID: **18041282-01AMSD** Units: **mg/Kg** Analysis Date: **4/23/2018 10:09 AM**

Client ID: **4151** Run ID: **HG1_180423A** SeqNo: **4993955** Prep Date: **4/22/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1353	0.016	0.1345	-0.001078	101	75-125	0.1351	0.0942	35	

The following samples were analyzed in this batch: 18041282-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041282
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117213** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117213-117213** Units: **mg/Kg** Analysis Date: **4/23/2018 12:27 PM**
Client ID: Run ID: **ICPMS3_180423A** SeqNo: **4994349** Prep Date: **4/23/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	ND	1.0								
Cadmium	ND	0.10								
Lead	0.0074	0.25								J
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117213-117213** Units: **mg/Kg** Analysis Date: **4/23/2018 12:33 PM**
Client ID: Run ID: **ICPMS3_180423A** SeqNo: **4994353** Prep Date: **4/23/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.783	0.25	5	0	95.7	80-120	0			
Barium	4.736	0.25	5	0	94.7	80-120	0			
Beryllium	4.652	0.10	5	0	93	80-120	0			
Boron	23.88	1.0	25	0	95.5	80-120	0			
Cadmium	4.698	0.10	5	0	94	80-120	0			
Lead	4.849	0.25	5	0	97	80-120	0			
Lithium	5.038	0.50	5	0	101	80-120	0			
Molybdenum	4.892	0.25	5	0	97.8	80-120	0			
Selenium	4.76	0.25	5	0	95.2	80-120	0			

MS Sample ID: **18041282-01AMS** Units: **mg/Kg** Analysis Date: **4/23/2018 12:36 PM**
Client ID: **4151** Run ID: **ICPMS3_180423A** SeqNo: **4994355** Prep Date: **4/23/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	7.332	0.32	6.477	0.4897	106	75-125	0			
Barium	12.33	0.32	6.477	4.4	122	75-125	0			
Beryllium	5.96	0.13	6.477	0.03073	91.6	75-125	0			
Boron	32.7	1.3	32.38	1.11	97.6	75-125	0			
Cadmium	5.891	0.13	6.477	0.008763	90.8	75-125	0			
Lead	7.189	0.32	6.477	0.7923	98.8	75-125	0			
Lithium	8.236	0.65	6.477	1.379	106	75-125	0			
Molybdenum	10.33	0.32	6.477	1.096	143	75-125	0			S
Selenium	6.253	0.32	6.477	0.2329	93	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041282
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117213** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18041282-01AMSD** Units: **mg/Kg** Analysis Date: **4/23/2018 12:38 PM**
Client ID: **4151** Run ID: **ICPMS3_180423A** SeqNo: **4994356** Prep Date: **4/23/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	6.597	0.32	6.46	0.4897	94.5	75-125	7.332	10.6	20	
Barium	13.03	0.32	6.46	4.4	134	75-125	12.33	5.56	20	S
Beryllium	6.027	0.13	6.46	0.03073	92.8	75-125	5.96	1.12	20	
Boron	33.02	1.3	32.3	1.11	98.8	75-125	32.7	0.951	20	
Cadmium	5.815	0.13	6.46	0.008763	89.9	75-125	5.891	1.29	20	
Lead	7.534	0.32	6.46	0.7923	104	75-125	7.189	4.69	20	
Lithium	8.453	0.65	6.46	1.379	110	75-125	8.236	2.6	20	
Molybdenum	7.33	0.32	6.46	1.096	96.5	75-125	10.33	34	20	R
Selenium	6.274	0.32	6.46	0.2329	93.5	75-125	6.253	0.332	20	

The following samples were analyzed in this batch: 18041282-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041282
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117236** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-117236-117236** Units: **mg/Kg** Analysis Date: **4/23/2018 11:18 AM**
Client ID: Run ID: **IC4_180423A** SeqNo: **4994784** Prep Date: **4/22/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

LCS Sample ID: **LCS-117236-117236** Units: **mg/Kg** Analysis Date: **4/23/2018 10:59 AM**
Client ID: Run ID: **IC4_180423A** SeqNo: **4994781** Prep Date: **4/22/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	97.56	10	100	0	97.6	80-120	0			

MS Sample ID: **18041282-01A MS** Units: **mg/Kg** Analysis Date: **4/23/2018 12:16 PM**
Client ID: **4151** Run ID: **IC4_180423A** SeqNo: **4994791** Prep Date: **4/22/2018** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	95.26	19	96.9	2.909	95.3	75-125	0			

MSD Sample ID: **18041282-01A MSD** Units: **mg/Kg** Analysis Date: **4/23/2018 12:35 PM**
Client ID: **4151** Run ID: **IC4_180423A** SeqNo: **4994794** Prep Date: **4/22/2018** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	94.97	20	99.6	2.909	92.4	75-125	95.26	0.302	20	

The following samples were analyzed in this batch: 18041282-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041282
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R234410** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R234410** Units: **% of sample** Analysis Date: **4/23/2018 04:30 PM**
Client ID: Run ID: **MOIST_180423A** SeqNo: **4996115** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R234410** Units: **% of sample** Analysis Date: **4/23/2018 04:30 PM**
Client ID: Run ID: **MOIST_180423A** SeqNo: **4996113** 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: **18041282-01A DUP** Units: **% of sample** Analysis Date: **4/23/2018 04:30 PM**
Client ID: **4151** Run ID: **MOIST_180423A** SeqNo: **4996098** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	20.89	0.050	0	0	0	0-0	22.03	5.31	10	

The following samples were analyzed in this batch: 18041282-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39477

ALS Project Manager: | ALS Work Order #: 1804 1252

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CYAP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	engineering environmental solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn	Judy Vischer	D	
Address	90 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland MI 49424	City/State/Zip		G	
Phone	616-931-3967	Phone		H	
Fax		Fax		I	
e-Mail Address	Blaine.litteral@geoet solutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4151	4/20	2pm	Soil		1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 4/20	Time:	Received by:	
Relinquished by:	Date: 4/20	Time: 1630	Received by (Laboratory):	
Logged by (Laboratory): Kel	Date: 4/20/18	Time: 1655	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
SR2	5.4°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **20-Apr-18 16:30**

Work Order: **18041282** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 20-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 23-Apr-18 (Date)

Matrices: Soil

Carrier name: Client

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):	5.4/5.4 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/20/2018 4:56:31 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:

25-Apr-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18041028**

Dear Blaine, Revision: **1**

ALS Environmental received 2 samples on 18-Apr-2018 12:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 15.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 25-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18041028**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18041028-01	4037	Soil		4/18/2018 10:50	4/18/2018 12:00	☐
18041028-02	4038	Soil		4/18/2018 11:00	4/18/2018 12:00	☐

ALS Group, USA

Date: 25-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18041028**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

ALS Group, USA

Date: *25-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041028
Sample ID: 4037
Lab ID: 18041028-01
Collection Date: 4/18/2018 10:50 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**	Prep: SW7470 4/25/18 11:27		Analyst: **RSH**
Mercury	ND		0.00020	mg/L	1	4/25/2018 01:09 PM
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/19/18 13:56		Analyst: **RSH**
Mercury	**0.22**		**0.037**	**mg/Kg-dry**	1	4/20/2018 02:29 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/18/18 14:40		Analyst: **JF**
Arsenic	**7.4**		**0.10**	**mg/Kg-dry**	1	4/18/2018 05:49 PM
Barium	**160**		**0.86**	**mg/Kg-dry**	1	4/18/2018 05:49 PM
Beryllium	**0.63**		**0.34**	**mg/Kg-dry**	1	4/18/2018 05:49 PM
Boron	**20**		**3.4**	**mg/Kg-dry**	1	4/18/2018 05:49 PM
Cadmium	**0.49**		**0.17**	**mg/Kg-dry**	1	4/18/2018 05:49 PM
Lead	**37**		**0.86**	**mg/Kg-dry**	1	4/18/2018 05:49 PM
Lithium	**23**		**0.34**	**mg/Kg-dry**	1	4/18/2018 05:49 PM
Molybdenum	ND		0.86	mg/Kg-dry	1	4/18/2018 05:49 PM
Selenium	**3.1**		**0.17**	**mg/Kg-dry**	1	4/18/2018 05:49 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 4/24/18 14:11		Analyst: **JF**
Lithium	**0.014**		**0.010**	**mg/L**	1	4/25/2018 01:26 PM
Selenium	ND		0.0050	mg/L	1	4/25/2018 01:26 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/18/18 17:00		Analyst: **EE**
Sulfate	**24**		**20**	**mg/Kg-dry**	1	4/19/2018 12:01 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**52**		**0.050**	**% of sample**	1	4/18/2018 07:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *25-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041028
Sample ID: 4038
Lab ID: 18041028-02
Collection Date: 4/18/2018 11:00 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470A**	Prep: SW7470 4/25/18 11:27		Analyst: **RSH**
Mercury	ND		0.00020	mg/L	1	4/25/2018 01:11 PM
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/19/18 13:56		Analyst: **RSH**
Mercury	**0.19**		**0.038**	**mg/Kg-dry**	1	4/20/2018 02:31 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/18/18 14:40		Analyst: **JF**
Arsenic	**6.7**		**0.088**	**mg/Kg-dry**	1	4/18/2018 05:51 PM
Barium	**170**		**0.73**	**mg/Kg-dry**	1	4/18/2018 05:51 PM
Beryllium	**0.83**		**0.29**	**mg/Kg-dry**	1	4/18/2018 05:51 PM
Boron	**19**		**2.9**	**mg/Kg-dry**	1	4/18/2018 05:51 PM
Cadmium	**0.62**		**0.15**	**mg/Kg-dry**	1	4/18/2018 05:51 PM
Lead	**34**		**0.73**	**mg/Kg-dry**	1	4/18/2018 05:51 PM
Lithium	**32**		**0.29**	**mg/Kg-dry**	1	4/18/2018 05:51 PM
Molybdenum	ND		0.73	mg/Kg-dry	1	4/18/2018 05:51 PM
Selenium	**3.4**		**0.15**	**mg/Kg-dry**	1	4/18/2018 05:51 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 4/24/18 14:11		Analyst: **JF**
Lithium	ND		0.010	mg/L	1	4/25/2018 01:33 PM
Selenium	ND		0.0050	mg/L	1	4/25/2018 01:33 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/18/18 17:00		Analyst: **EE**
Sulfate	ND		21	mg/Kg-dry	1	4/19/2018 12:20 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**52**		**0.050**	**% of sample**	1	4/18/2018 07:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

QC BATCH REPORT

Batch ID: **117094** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-117094-117094**				Units: **mg/Kg**			Analysis Date: **4/20/2018 10:32 AM**			
Client ID:	Run ID: **HG1_180420A**				SeqNo: **4991974**			Prep Date: **4/19/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	ND	0.020									

MBLK	Sample ID: **MBLK-117094-117094**				Units: **mg/Kg**			Analysis Date: **4/20/2018 10:32 AM**			
Client ID:	Run ID: **HG1_180420A**				SeqNo: **4991979**			Prep Date: **4/19/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	ND	0.020									

LCS	Sample ID: **LCS-117094-117094**				Units: **mg/Kg**			Analysis Date: **4/20/2018 11:08 AM**			
Client ID:	Run ID: **HG1_180420A**				SeqNo: **4991989**			Prep Date: **4/19/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1675	0.020	0.1665	0	101	80-120	0				

MS	Sample ID: **1804896-01AMS**				Units: **mg/Kg**			Analysis Date: **4/20/2018 03:04 PM**			
Client ID:	Run ID: **HG1_180420B**				SeqNo: **4992063**			Prep Date: **4/19/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1523	0.019	0.1561	0.01995	84.8	75-125	0				

MSD	Sample ID: **1804896-01AMSD**				Units: **mg/Kg**			Analysis Date: **4/20/2018 03:07 PM**			
Client ID:	Run ID: **HG1_180420B**				SeqNo: **4992064**			Prep Date: **4/19/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1545	0.019	0.1551	0.01995	86.7	75-125	0.1523	1.41	35		

The following samples were analyzed in this batch:

18041028-01A	18041028-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041028
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117383** Instrument ID **HG1** Method: **SW7470A**

MBLK Sample ID: **MBLK-117383-117383** Units: **mg/L** Analysis Date: **4/25/2018 01:04 PM**
Client ID: Run ID: **HG1_180425A** SeqNo: **4999247** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS Sample ID: **LCS-117383-117383** Units: **mg/L** Analysis Date: **4/25/2018 01:06 PM**
Client ID: Run ID: **HG1_180425A** SeqNo: **4999249** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00238	0.00020	0.002	0	119	80-120	0			

MS Sample ID: **18041072-01BMS** Units: **mg/L** Analysis Date: **4/25/2018 01:27 PM**
Client ID: Run ID: **HG1_180425A** SeqNo: **4999435** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00226	0.00020	0.002	0.000009	113	75-125	0			

MSD Sample ID: **18041072-01BMSD** Units: **mg/L** Analysis Date: **4/25/2018 01:29 PM**
Client ID: Run ID: **HG1_180425A** SeqNo: **4999436** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00217	0.00020	0.002	0.000009	108	75-125	0.00226	4.06	20	

The following samples were analyzed in this batch:

18041028-01A	18041028-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041028
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117023** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117023-117023** Units: **mg/Kg** Analysis Date: **4/18/2018 05:45 PM**
Client ID: Run ID: **ICPMS3_180418A** SeqNo: **4988552** Prep Date: **4/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.2109	1.0								J
Cadmium	ND	0.10								
Lead	0.0209	0.25								J
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117023-117023** Units: **mg/Kg** Analysis Date: **4/18/2018 05:47 PM**
Client ID: Run ID: **ICPMS3_180418A** SeqNo: **4988553** Prep Date: **4/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.747	0.25	5	0	94.9	80-120	0			
Barium	4.937	0.25	5	0	98.7	80-120	0			
Beryllium	4.593	0.10	5	0	91.9	80-120	0			
Boron	23.46	1.0	25	0	93.9	80-120	0			
Cadmium	4.744	0.10	5	0	94.9	80-120	0			
Lead	5.101	0.25	5	0	102	80-120	0			
Lithium	5.162	0.50	5	0	103	80-120	0			
Molybdenum	4.977	0.25	5	0	99.5	80-120	0			
Selenium	4.556	0.25	5	0	91.1	80-120	0			

MS Sample ID: **1804866-01BMS** Units: **mg/Kg** Analysis Date: **4/18/2018 05:54 PM**
Client ID: Run ID: **ICPMS3_180418A** SeqNo: **4988557** Prep Date: **4/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.559	0.38	7.68	1.565	91.1	75-125	0			
Barium	19.94	0.38	7.68	11.39	111	75-125	0			
Beryllium	7.137	0.15	7.68	0.1142	91.4	75-125	0			
Boron	36.88	1.5	38.4	1.812	91.3	75-125	0			
Cadmium	7.21	0.15	7.68	0.1193	92.3	75-125	0			
Lead	14.77	0.38	7.68	4.717	131	75-125	0			S
Lithium	11.15	0.77	7.68	1.862	121	75-125	0			
Molybdenum	8.272	0.38	7.68	0.7655	97.7	75-125	0			
Selenium	7.359	0.38	7.68	0.3608	91.1	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041028
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117023** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **1804866-01BMSD** Units: **mg/Kg** Analysis Date: **4/18/2018 05:56 PM**
Client ID: Run ID: **ICPMS3_180418A** SeqNo: **4988558** Prep Date: **4/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.607	0.38	7.669	1.565	91.8	75-125	8.559	0.557	20	
Barium	18.88	0.38	7.669	11.39	97.6	75-125	19.94	5.47	20	
Beryllium	7.193	0.15	7.669	0.1142	92.3	75-125	7.137	0.776	20	
Boron	37.14	1.5	38.34	1.812	92.1	75-125	36.88	0.698	20	
Cadmium	7.294	0.15	7.669	0.1193	93.6	75-125	7.21	1.16	20	
Lead	11.16	0.38	7.669	4.717	84	75-125	14.77	27.9	20	R
Lithium	11.22	0.77	7.669	1.862	122	75-125	11.15	0.668	20	
Molybdenum	8.364	0.38	7.669	0.7655	99.1	75-125	8.272	1.11	20	
Selenium	7.676	0.38	7.669	0.3608	95.4	75-125	7.359	4.23	20	

The following samples were analyzed in this batch:

18041028-01A	18041028-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041028
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117277** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117277-117277** Units: **mg/L** Analysis Date: **4/25/2018 01:23 PM**
Client ID: Run ID: **ICPMS3_180425A** SeqNo: **4999493** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lithium	ND	0.010								
Selenium	ND	0.0050								

LCS Sample ID: **LCS-117277-117277** Units: **mg/L** Analysis Date: **4/25/2018 01:25 PM**
Client ID: Run ID: **ICPMS3_180425A** SeqNo: **4999494** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lithium	0.09996	0.010	0.1	0	100	80-120	0			
Selenium	0.09553	0.0050	0.1	0	95.5	80-120	0			

The following samples were analyzed in this batch: 18041028-01A 18041028-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041028
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117103** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-117103-117103** Units: **mg/Kg** Analysis Date: **4/19/2018 11:22 AM**
Client ID: Run ID: **IC3_180419A** SeqNo: **4989819** Prep Date: **4/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

LCS Sample ID: **LCS-117103-117103** Units: **mg/Kg** Analysis Date: **4/19/2018 11:42 AM**
Client ID: Run ID: **IC3_180419A** SeqNo: **4989820** Prep Date: **4/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	96.74	10	100	0	96.7	80-120	0			

MS Sample ID: **18041028-02A MS** Units: **mg/Kg** Analysis Date: **4/19/2018 12:44 PM**
Client ID: **4038** Run ID: **IC3_180419A** SeqNo: **4989823** Prep Date: **4/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	94.53	9.6	96.34	3.124	94.9	75-125	0			

MSD Sample ID: **18041028-02A MSD** Units: **mg/Kg** Analysis Date: **4/19/2018 01:04 PM**
Client ID: **4038** Run ID: **IC3_180419A** SeqNo: **4989824** Prep Date: **4/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	95.69	9.8	97.85	3.124	94.6	75-125	94.53	1.22	20	

The following samples were analyzed in this batch:

18041028-01A	18041028-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041028
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R234107** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R234107** Units: **% of sample** Analysis Date: **4/18/2018 07:15 PM**
Client ID: Run ID: **MOIST_180418D** SeqNo: **4989271** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R234107** Units: **% of sample** Analysis Date: **4/18/2018 07:15 PM**
Client ID: Run ID: **MOIST_180418D** SeqNo: **4989270** 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: **18041005-01B DUP** Units: **% of sample** Analysis Date: **4/18/2018 07:15 PM**
Client ID: Run ID: **MOIST_180418D** SeqNo: **4989253** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.44	0.050	0	0	0	0-0	15.25	1.24	10	

DUP Sample ID: **18041005-02B DUP** Units: **% of sample** Analysis Date: **4/18/2018 07:15 PM**
Client ID: Run ID: **MOIST_180418D** SeqNo: **4989255** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	16.66	0.050	0	0	0	0-0	16.95	1.73	10	

The following samples were analyzed in this batch:

18041028-01A	18041028-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39475

ALS Project Manager: | ALS Work Order #: 18041028

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung LYAP	A	see attached
Work Order		Project Number	133-17-001	B	
Company Name	engineering + environmental solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	(616) 931-3967	Phone		H	
Fax		Fax		I	
e-Mail Address	Blaine.Litteral@goeesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4037	4/18	10:50 am	Soil		1	X										
2	~~4038~~ 4038	4/18	11 am	Soil		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell			
Relinquished by:	Date: 4/18/18	Time: 1200	Received by (Laboratory):
Logged by (Laboratory): DFS	Date: 4/18/18	Time: 1210	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	11.8-c

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **18-Apr-18 12:00**

Work Order: **18041028** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 18-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 18-Apr-18 (Date)

Matrices: Soil

Carrier name: ALSHN

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):	11.8/11.8 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/18/2018 12:13:55 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:

25-Apr-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18041341**

Dear Blaine,

ALS Environmental received 4 samples on 23-Apr-2018 11:45 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 15.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

ALS Group, USA

Date: 25-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18041341**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18041341-01	4055	Soil		4/23/2018 09:40	4/23/2018 11:45	☐
18041341-02	4063	Soil		4/23/2018 11:00	4/23/2018 11:45	☐
18041341-03	4066	Soil		4/23/2018 10:00	4/23/2018 11:45	☐
18041341-04	4079	Soil		4/23/2018 10:28	4/23/2018 11:45	☐

ALS Group, USA

Date: 25-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18041341**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *25-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041341
Sample ID: 4055
Lab ID: 18041341-01
Collection Date: 4/23/2018 09:40 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/24/18 08:15		Analyst: **RSH**
Mercury	ND		0.023	mg/Kg-dry	1	4/24/2018 03:36 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/24/18 11:30		Analyst: **JF**
Arsenic	**3.9**		**0.057**	**mg/Kg-dry**	1	4/24/2018 12:46 PM
Barium	**22**		**0.47**	**mg/Kg-dry**	1	4/24/2018 12:46 PM
Beryllium	ND		0.19	mg/Kg-dry	1	4/24/2018 12:46 PM
Boron	**3.9**		**1.9**	**mg/Kg-dry**	1	4/24/2018 12:46 PM
Cadmium	ND		0.094	mg/Kg-dry	1	4/24/2018 12:46 PM
Lead	**2.7**		**0.47**	**mg/Kg-dry**	1	4/24/2018 12:46 PM
Lithium	**2.8**		**0.19**	**mg/Kg-dry**	1	4/24/2018 12:46 PM
Molybdenum	**12**		**0.47**	**mg/Kg-dry**	1	4/24/2018 12:46 PM
Selenium	**5.2**		**0.094**	**mg/Kg-dry**	1	4/24/2018 12:46 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/23/18 17:00		Analyst: **EE**
Sulfate	**59**		**13**	**mg/Kg-dry**	1	4/24/2018 09:33 AM
MOISTURE			**SW3550C**			Analyst: **RZM**
Moisture	**24**		**0.050**	**% of sample**	1	4/23/2018 04:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041341
Sample ID: 4063
Lab ID: 18041341-02
Collection Date: 4/23/2018 11:00 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/24/18 08:15		Analyst: **RSH**
Mercury	ND		0.016	mg/Kg-dry	1	4/24/2018 03:39 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/24/18 11:30		Analyst: **JF**
Arsenic	**1.9**		**0.048**	**mg/Kg-dry**	1	4/24/2018 12:48 PM
Barium	**4.7**		**0.40**	**mg/Kg-dry**	1	4/24/2018 12:48 PM
Beryllium	ND		0.16	mg/Kg-dry	1	4/24/2018 12:48 PM
Boron	**1.6**		**1.6**	**mg/Kg-dry**	1	4/24/2018 12:48 PM
Cadmium	ND		0.079	mg/Kg-dry	1	4/24/2018 12:48 PM
Lead	**3.3**		**0.40**	**mg/Kg-dry**	1	4/24/2018 12:48 PM
Lithium	**2.5**		**0.16**	**mg/Kg-dry**	1	4/24/2018 12:48 PM
Molybdenum	**1.0**		**0.40**	**mg/Kg-dry**	1	4/24/2018 12:48 PM
Selenium	ND		0.079	mg/Kg-dry	1	4/24/2018 12:48 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/23/18 17:00		Analyst: **EE**
Sulfate	**15**		**10**	**mg/Kg-dry**	1	4/24/2018 09:55 AM
MOISTURE			**SW3550C**			Analyst: **RZM**
Moisture	**3.5**		**0.050**	**% of sample**	1	4/23/2018 04:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041341
Sample ID: 4066
Lab ID: 18041341-03
Collection Date: 4/23/2018 10:00 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/24/18 08:15		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	4/24/2018 03:42 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/24/18 11:30		Analyst: **JF**
Arsenic	**6.6**		**0.049**	**mg/Kg-dry**	1	4/24/2018 12:55 PM
Barium	**9.8**		**0.40**	**mg/Kg-dry**	1	4/24/2018 12:55 PM
Beryllium	ND		0.16	mg/Kg-dry	1	4/24/2018 12:55 PM
Boron	**3.1**		**1.6**	**mg/Kg-dry**	1	4/24/2018 12:55 PM
Cadmium	ND		0.081	mg/Kg-dry	1	4/24/2018 12:55 PM
Lead	**1.5**		**0.40**	**mg/Kg-dry**	1	4/24/2018 12:55 PM
Lithium	**2.3**		**0.16**	**mg/Kg-dry**	1	4/24/2018 12:55 PM
Molybdenum	**37**		**0.40**	**mg/Kg-dry**	1	4/24/2018 12:55 PM
Selenium	**0.19**		**0.081**	**mg/Kg-dry**	1	4/24/2018 12:55 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/23/18 17:00		Analyst: **EE**
Sulfate	**56**		**13**	**mg/Kg-dry**	1	4/24/2018 10:14 AM
MOISTURE			**SW3550C**			Analyst: **RZM**
Moisture	**22**		**0.050**	**% of sample**	1	4/23/2018 04:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *25-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041341
Sample ID: 4079
Lab ID: 18041341-04
Collection Date: 4/23/2018 10:28 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/24/18 08:15		Analyst: **RSH**
Mercury	**0.022**		**0.020**	**mg/Kg-dry**	1	4/24/2018 03:44 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/24/18 11:30		Analyst: **JF**
Arsenic	**2.3**		**0.056**	**mg/Kg-dry**	1	4/24/2018 12:56 PM
Barium	**8.7**		**0.47**	**mg/Kg-dry**	1	4/24/2018 12:56 PM
Beryllium	ND		0.19	mg/Kg-dry	1	4/24/2018 12:56 PM
Boron	**2.2**		**1.9**	**mg/Kg-dry**	1	4/24/2018 12:56 PM
Cadmium	**0.10**		**0.094**	**mg/Kg-dry**	1	4/24/2018 12:56 PM
Lead	**4.9**		**0.47**	**mg/Kg-dry**	1	4/24/2018 12:56 PM
Lithium	**2.4**		**0.19**	**mg/Kg-dry**	1	4/24/2018 12:56 PM
Molybdenum	**1.6**		**0.47**	**mg/Kg-dry**	1	4/24/2018 12:56 PM
Selenium	**0.37**		**0.094**	**mg/Kg-dry**	1	4/24/2018 12:56 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/23/18 17:00		Analyst: **EE**
Sulfate	**250**		**24**	**mg/Kg-dry**	2	4/24/2018 01:47 PM
MOISTURE			**SW3550C**			Analyst: **RZM**
Moisture	**19**		**0.050**	**% of sample**	1	4/23/2018 04:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 25-Apr-18

Client: Engineering & Environmental Solutions

QC BATCH REPORT

Work Order: 18041341

Project: James DeYoung CYAP

Batch ID: **117254** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-117254-117254** Units: **mg/Kg** Analysis Date: **4/24/2018 03:31 PM**

Client ID: Run ID: **HG1_180424A** SeqNo: **4997280** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-117254-117254** Units: **mg/Kg** Analysis Date: **4/24/2018 03:52 PM**

Client ID: Run ID: **HG1_180424A** SeqNo: **4997288** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1583	0.020	0.1665	0	95.1	80-120	0			

MS Sample ID: **1804866-05BMS** Units: **mg/Kg** Analysis Date: **4/24/2018 04:02 PM**

Client ID: Run ID: **HG1_180424A** SeqNo: **4997373** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1793	0.017	0.1433	0.01512	115	75-125	0			

MSD Sample ID: **1804866-05BMSD** Units: **mg/Kg** Analysis Date: **4/24/2018 04:05 PM**

Client ID: Run ID: **HG1_180424A** SeqNo: **4997374** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1819	0.017	0.1431	0.01512	117	75-125	0.1793	1.44	35	

The following samples were analyzed in this batch:

18041341-01A	18041341-02A	18041341-03A
18041341-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041341
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117273** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117273-117273** Units: **mg/Kg** Analysis Date: **4/24/2018 12:43 PM**
Client ID: Run ID: **ICPMS3_180424A** SeqNo: **4997144** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.05905	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117273-117273** Units: **mg/Kg** Analysis Date: **4/24/2018 12:45 PM**
Client ID: Run ID: **ICPMS3_180424A** SeqNo: **4997145** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.5	0.25	5	0	90	80-120	0			
Barium	4.703	0.25	5	0	94.1	80-120	0			
Beryllium	4.541	0.10	5	0	90.8	80-120	0			
Boron	22.56	1.0	25	0	90.2	80-120	0			
Cadmium	4.696	0.10	5	0	93.9	80-120	0			
Lead	4.761	0.25	5	0	95.2	80-120	0			
Lithium	4.797	0.50	5	0	95.9	80-120	0			
Molybdenum	4.666	0.25	5	0	93.3	80-120	0			
Selenium	4.598	0.25	5	0	92	80-120	0			

MS Sample ID: **18041341-02AMS** Units: **mg/Kg** Analysis Date: **4/24/2018 12:50 PM**
Client ID: **4063** Run ID: **ICPMS3_180424A** SeqNo: **4997148** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.657	0.38	7.657	1.814	89.4	75-125	0			
Barium	14.23	0.38	7.657	4.572	126	75-125	0			S
Beryllium	7.055	0.15	7.657	0.03681	91.7	75-125	0			
Boron	37.15	1.5	38.28	1.592	92.9	75-125	0			
Cadmium	6.809	0.15	7.657	0.002914	88.9	75-125	0			
Lead	10.24	0.38	7.657	3.23	91.5	75-125	0			
Lithium	12.69	0.77	7.657	2.436	134	75-125	0			S
Molybdenum	8.49	0.38	7.657	0.9929	97.9	75-125	0			
Selenium	6.989	0.38	7.657	0.07661	90.3	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041341
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117273** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18041341-02AMSD** Units: **mg/Kg** Analysis Date: **4/24/2018 12:51 PM**
Client ID: **4063** Run ID: **ICPMS3_180424A** SeqNo: **4997149** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.963	0.38	7.657	1.814	93.4	75-125	8.657	3.48	20	
Barium	14.02	0.38	7.657	4.572	123	75-125	14.23	1.46	20	
Beryllium	7.085	0.15	7.657	0.03681	92.1	75-125	7.055	0.426	20	
Boron	36.62	1.5	38.28	1.592	91.5	75-125	37.15	1.46	20	
Cadmium	6.815	0.15	7.657	0.002914	89	75-125	6.809	0.0933	20	
Lead	10.09	0.38	7.657	3.23	89.5	75-125	10.24	1.49	20	
Lithium	10.56	0.77	7.657	2.436	106	75-125	12.69	18.3	20	
Molybdenum	7.796	0.38	7.657	0.9929	88.8	75-125	8.49	8.53	20	
Selenium	6.94	0.38	7.657	0.07661	89.6	75-125	6.989	0.704	20	

The following samples were analyzed in this batch:

18041341-01A	18041341-02A	18041341-03A
18041341-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041341
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117316** Instrument ID **IC4** Method: **SW9056A**

MBLK Sample ID: **MBLK-117316-117316** Units: **mg/Kg** Analysis Date: **4/24/2018 08:53 AM**
Client ID: Run ID: **IC4_180424A** SeqNo: **4997221** Prep Date: **4/23/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

LCS Sample ID: **LCS-117316-117316** Units: **mg/Kg** Analysis Date: **4/24/2018 07:59 AM**
Client ID: Run ID: **IC4_180424A** SeqNo: **4997220** Prep Date: **4/23/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	97.9	10	100	0	97.9	80-120	0			

MS Sample ID: **18041341-02A MS** Units: **mg/Kg** Analysis Date: **4/24/2018 01:09 PM**
Client ID: **4063** Run ID: **IC4_180424A** SeqNo: **4997233** Prep Date: **4/23/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	112.4	9.9	99.4	14.63	98.4	75-125	0			

MSD Sample ID: **18041341-02A MSD** Units: **mg/Kg** Analysis Date: **4/24/2018 01:28 PM**
Client ID: **4063** Run ID: **IC4_180424A** SeqNo: **4997234** Prep Date: **4/23/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	109.7	9.7	97.09	14.63	97.9	75-125	112.4	2.45	20	

The following samples were analyzed in this batch:

18041341-01A	18041341-02A	18041341-03A
18041341-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041341
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R234410** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R234410** Units: **% of sample** Analysis Date: **4/23/2018 04:30 PM**
Client ID: Run ID: **MOIST_180423A** SeqNo: **4996115** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R234410** Units: **% of sample** Analysis Date: **4/23/2018 04:30 PM**
Client ID: Run ID: **MOIST_180423A** SeqNo: **4996113** 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: **18041282-01A DUP** Units: **% of sample** Analysis Date: **4/23/2018 04:30 PM**
Client ID: Run ID: **MOIST_180423A** SeqNo: **4996098** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	20.89	0.050	0	0	0	0-0	22.03	5.31	10	

The following samples were analyzed in this batch:

18041341-01A	18041341-02A	18041341-03A
18041341-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39478

ALS Project Manager: | ALS Work Order #: 1804134 1

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeMong CHAP	A	See attached
Work Order		Project Number	133-17-004	B	
Company Name	engineering + environmental solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	400 Beth Ave Bldg 100 suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	616-931-3961	Phone		H	
Fax		Fax		I	
e-Mail Address	blaine.litteral@geosolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4055	4/23/18	9:40am	Soil		1	X										
2	4063	4/23/18	11:00am	Soil		1	X										
3	4066	4/23/18	10:00am	Soil		1	X										
4	4079	4/23/18	10:28am	Soil		1	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 4.23.18	Time: 1145	Received by:	Notes:	
Relinquished by:	Date: 4/23/18	Time: 1145	Received by (Laboratory):	Cooler ID: SR2	Cooler Temp: 19.6°C
Logged by (Laboratory): DFS	Date: 4/23/18	Time: 1345	Checked by (Laboratory):		

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **23-Apr-18 11:45**

Work Order: **18041341** Received by: **KRW**

Checklist completed by Diane Shaw (eSignature) 23-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 23-Apr-18 (Date)

Matrices: Soil

Carrier name: Client

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):	19.6/19.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/23/2018 1:50:40 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:

30-Apr-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18041689**

Dear Blaine,

ALS Environmental received 2 samples on 27-Apr-2018 11:46 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 13.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

ALS Group, USA

Date: 30-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18041689**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18041689-01	4102	Soil		4/27/2018 09:30	4/27/2018 11:46	☐
18041689-02	4150	Soil		4/27/2018 11:05	4/27/2018 11:46	☐

ALS Group, USA

Date: 30-Apr-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18041689**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *30-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041689
Sample ID: 4102
Lab ID: 18041689-01
Collection Date: 4/27/2018 09:30 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/29/18 18:42		Analyst: **RSH**
Mercury	ND		0.017	mg/Kg-dry	1	4/29/2018 09:22 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/27/18 12:47		Analyst: **RH**
Arsenic	**2.3**		**0.050**	**mg/Kg-dry**	1	4/29/2018 09:53 PM
Barium	**6.3**		**0.42**	**mg/Kg-dry**	1	4/29/2018 09:53 PM
Beryllium	ND		0.17	mg/Kg-dry	1	4/29/2018 09:53 PM
Boron	ND		1.7	mg/Kg-dry	1	4/29/2018 09:53 PM
Cadmium	ND		0.083	mg/Kg-dry	1	4/29/2018 09:53 PM
Lead	**1.1**		**0.42**	**mg/Kg-dry**	1	4/29/2018 09:53 PM
Lithium	**1.4**		**0.17**	**mg/Kg-dry**	1	4/29/2018 09:53 PM
Molybdenum	**0.93**		**0.42**	**mg/Kg-dry**	1	4/29/2018 09:53 PM
Selenium	**0.28**		**0.083**	**mg/Kg-dry**	1	4/29/2018 09:53 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**7.9**		**0.050**	**% of sample**	1	4/27/2018 04:45 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 4/27/18 21:30		Analyst: **STP**
Sulfate	**170**	x	**10**	**mg/Kg-dry**	1	4/30/2018 01:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *30-Apr-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041689
Sample ID: 4150
Lab ID: 18041689-02
Collection Date: 4/27/2018 11:05 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/29/18 18:42		Analyst: **RSH**
Mercury	ND		0.016	mg/Kg-dry	1	4/29/2018 09:24 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/27/18 12:47		Analyst: **RH**
Arsenic	**5.8**		**0.052**	**mg/Kg-dry**	1	4/29/2018 09:54 PM
Barium	**6.2**		**0.43**	**mg/Kg-dry**	1	4/29/2018 09:54 PM
Beryllium	ND		0.17	mg/Kg-dry	1	4/29/2018 09:54 PM
Boron	ND		1.7	mg/Kg-dry	1	4/29/2018 09:54 PM
Cadmium	ND		0.087	mg/Kg-dry	1	4/29/2018 09:54 PM
Lead	**1.1**		**0.43**	**mg/Kg-dry**	1	4/29/2018 09:54 PM
Lithium	**1.4**		**0.17**	**mg/Kg-dry**	1	4/29/2018 09:54 PM
Molybdenum	**1.3**		**0.43**	**mg/Kg-dry**	1	4/29/2018 09:54 PM
Selenium	**0.29**		**0.087**	**mg/Kg-dry**	1	4/29/2018 09:54 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**8.3**		**0.050**	**% of sample**	1	4/27/2018 04:45 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 4/27/18 21:30		Analyst: **STP**
Sulfate	**160**	x	**10**	**mg/Kg-dry**	1	4/30/2018 01:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 30-Apr-18

Client: Engineering & Environmental Solutions

Work Order: 18041689

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117565** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-117565-117565**				Units: **mg/Kg**			Analysis Date: **4/29/2018 08:13 PM**			
Client ID:	Run ID: **HG1_180429A**				SeqNo: **5007160**			Prep Date: **4/29/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	ND	0.020									

LCS	Sample ID: **LCS-117565-117565**				Units: **mg/Kg**			Analysis Date: **4/29/2018 08:16 PM**			
Client ID:	Run ID: **HG1_180429A**				SeqNo: **5007161**			Prep Date: **4/29/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1975	0.020	0.1665	0	119	80-120	0				

MS	Sample ID: **18041328-54BMS**				Units: **mg/Kg**			Analysis Date: **4/29/2018 08:23 PM**			
Client ID:	Run ID: **HG1_180429A**				SeqNo: **5007164**			Prep Date: **4/29/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.163	0.016	0.1357	0.02291	103	75-125	0				

MSD	Sample ID: **18041328-54BMSD**				Units: **mg/Kg**			Analysis Date: **4/29/2018 08:26 PM**			
Client ID:	Run ID: **HG1_180429A**				SeqNo: **5007165**			Prep Date: **4/29/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1712	0.016	0.1352	0.02291	110	75-125	0.163	4.87	35		

The following samples were analyzed in this batch:

18041689-01A	18041689-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041689
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117522** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117522-117522** Units: **mg/Kg** Analysis Date: **4/27/2018 06:43 PM**
Client ID: Run ID: **ICPMS3_180427A** SeqNo: **5006812** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	0.0755	0.25								J
Beryllium	ND	0.10								
Boron	0.1793	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117522-117522** Units: **mg/Kg** Analysis Date: **4/27/2018 06:45 PM**
Client ID: Run ID: **ICPMS3_180427A** SeqNo: **5006813** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.767	0.25	5	0	95.3	80-120	0			
Barium	4.957	0.25	5	0	99.1	80-120	0			
Beryllium	4.803	0.10	5	0	96.1	80-120	0			
Boron	23.65	1.0	25	0	94.6	80-120	0			
Cadmium	4.97	0.10	5	0	99.4	80-120	0			
Lead	4.94	0.25	5	0	98.8	80-120	0			
Lithium	5.154	0.50	5	0	103	80-120	0			
Molybdenum	4.995	0.25	5	0	99.9	80-120	0			
Selenium	4.964	0.25	5	0	99.3	80-120	0			

MS Sample ID: **18041591-01CMS** Units: **mg/Kg** Analysis Date: **4/27/2018 06:49 PM**
Client ID: Run ID: **ICPMS3_180427A** SeqNo: **5006816** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.81	0.35	7.003	5.57	74.9	75-125	0			S
Barium	93.15	0.35	7.003	89.22	56.1	75-125	0			SO
Beryllium	7.418	0.14	7.003	0.5568	98	75-125	0			
Boron	39.65	1.4	35.01	4.378	101	75-125	0			
Cadmium	6.251	0.14	7.003	0.06921	88.3	75-125	0			
Lead	24.74	0.35	7.003	18.61	87.5	75-125	0			
Lithium	20.2	0.70	7.003	8.409	168	75-125	0			S
Molybdenum	7.085	0.35	7.003	1.38	81.5	75-125	0			
Selenium	8.307	0.35	7.003	1.937	91	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041689
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117522** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18041591-01CMSD** Units: **mg/Kg** Analysis Date: **4/27/2018 06:51 PM**
Client ID: Run ID: **ICPMS3_180427A** SeqNo: **5006817** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.87	0.35	6.983	5.57	75.9	75-125	10.81	0.52	20	
Barium	95.35	0.35	6.983	89.22	87.8	75-125	93.15	2.34	20	O
Beryllium	7.083	0.14	6.983	0.5568	93.4	75-125	7.418	4.63	20	
Boron	37.56	1.4	34.92	4.378	95	75-125	39.65	5.41	20	
Cadmium	6.233	0.14	6.983	0.06921	88.3	75-125	6.251	0.289	20	
Lead	25.72	0.35	6.983	18.61	102	75-125	24.74	3.88	20	
Lithium	18.94	0.70	6.983	8.409	151	75-125	20.2	6.43	20	S
Molybdenum	7.137	0.35	6.983	1.38	82.4	75-125	7.085	0.732	20	
Selenium	7.51	0.35	6.983	1.937	79.8	75-125	8.307	10.1	20	

The following samples were analyzed in this batch:

18041689-01A	18041689-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041689
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117547** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-117547-117547** Units: **mg/Kg** Analysis Date: **4/30/2018 01:00 PM**
Client ID: Run ID: **GALLERY_180430A** SeqNo: **5008533** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	4.116	10								Jx

MS Sample ID: **18041630-01AMS** Units: **mg/Kg** Analysis Date: **4/30/2018 01:00 PM**
Client ID: Run ID: **GALLERY_180430A** SeqNo: **5008535** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	6725	94	4717	1311	115	75-125	0			x

MSD Sample ID: **18041630-01AMSD** Units: **mg/Kg** Analysis Date: **4/30/2018 01:00 PM**
Client ID: Run ID: **GALLERY_180430A** SeqNo: **5008536** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	6485	98	4902	1311	106	75-125	6725	3.62	20	x

LCS1 Sample ID: **LCS1-117547-117547** Units: **mg/Kg** Analysis Date: **4/30/2018 01:00 PM**
Client ID: Run ID: **GALLERY_180430A** SeqNo: **5008541** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	104.8	10	100	0	105	80-120	0			x

LCS2 Sample ID: **LCS2-117547-117547** Units: **mg/Kg** Analysis Date: **4/30/2018 01:00 PM**
Client ID: Run ID: **GALLERY_180430A** SeqNo: **5008542** Prep Date: **4/27/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	534.8	10	500	0	107	80-120	0			x

The following samples were analyzed in this batch:

18041689-01A	18041689-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041689
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R234792** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R234792** Units: **% of sample** Analysis Date: **4/27/2018 04:45 PM**
Client ID: Run ID: **MOIST_180427B** SeqNo: **5005998** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R234792** Units: **% of sample** Analysis Date: **4/27/2018 04:45 PM**
Client ID: Run ID: **MOIST_180427B** SeqNo: **5005997** 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: **18041392-01A DUP** Units: **% of sample** Analysis Date: **4/27/2018 04:45 PM**
Client ID: Run ID: **MOIST_180427B** SeqNo: **5005977** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.57	0.050	0	0	0	0-0	11.14	3.79	10	

DUP Sample ID: **18041603-02B DUP** Units: **% of sample** Analysis Date: **4/27/2018 04:45 PM**
Client ID: Run ID: **MOIST_180427B** SeqNo: **5005990** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	61.33	0.050	0	0	0	0-0	61.25	0.131	10	H

The following samples were analyzed in this batch:

18041689-01A	18041689-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39332

ALS Project Manager: | ALS Work Order #: 8041689

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CAP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	engineering + environmental Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral, Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	616-931-3967	Phone		H	
Fax	Blaine.Litteral@goecsolutions.net	Fax		J	
e-Mail Address	Amy.Mandrell@goecsolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4102	4/27	9:30	Soil		1	X										
2	4150	4/27	11:05	Soil		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other _____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell	4/27	11:40	
Relinquished by:	Date:	Time:	Received by (Laboratory): 11:46 4/27
Logged by (Laboratory): DFS	Date: 4/27/18	Time: 1215	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SP2	15.0°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other _____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **27-Apr-18 11:46**

Work Order: **18041689** Received by: **SA**

Checklist completed by Diane Shaw (eSignature) 27-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 27-Apr-18 (Date)

Matrices: Soil

Carrier name: Client

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):	15.0/15.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/27/2018 12:15:52 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:

01-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18041363**

Dear Blaine, Revision: **1**

ALS Environmental received 1 sample on 23-Apr-2018 04:43 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 13.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 01-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18041363**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18041363-01	4030	Soil		4/23/2018 15:30	4/23/2018 16:43	☐

Revision: 1

ALS Group, USA

Date: 01-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18041363**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

ALS Group, USA

Date: *01-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041363
Sample ID: 4030
Lab ID: 18041363-01
Collection Date: 4/23/2018 03:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/24/18 08:15		Analyst: **RSH**
Mercury	**0.020**		**0.018**	**mg/Kg-dry**	1	4/24/2018 03:47 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/24/18 11:30		Analyst: **JF**
Arsenic	**2.5**		**0.050**	**mg/Kg-dry**	1	4/24/2018 12:58 PM
Barium	**53**		**0.41**	**mg/Kg-dry**	1	4/24/2018 12:58 PM
Beryllium	ND		0.17	mg/Kg-dry	1	4/24/2018 12:58 PM
Boron	**2.2**		**1.7**	**mg/Kg-dry**	1	4/24/2018 12:58 PM
Cadmium	ND		0.083	mg/Kg-dry	1	4/24/2018 12:58 PM
Lead	**1.7**		**0.41**	**mg/Kg-dry**	1	4/24/2018 12:58 PM
Lithium	**6.5**		**0.17**	**mg/Kg-dry**	1	4/24/2018 12:58 PM
Molybdenum	ND		0.41	mg/Kg-dry	1	4/24/2018 12:58 PM
Selenium	**3.3**		**0.083**	**mg/Kg-dry**	1	4/24/2018 12:58 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 5/1/18 14:33		Analyst: **JF**
Selenium	**0.0052**		**0.0050**	**mg/L**	1	5/1/2018 01:35 PM
ANIONS BY ION CHROMATOGRAPHY			**SW9056A**	Prep: EXTRACT 4/25/18 09:15		Analyst: **EE**
Sulfate	**37**		**11**	**mg/Kg-dry**	1	4/25/2018 11:17 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**13**		**0.050**	**% of sample**	1	4/24/2018 11:35 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: 01-May-18

Client: Engineering & Environmental Solutions

QC BATCH REPORT

Work Order: 18041363

Project: James DeYoung CYAP

Batch ID: **117254** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-117254-117254** Units: **mg/Kg** Analysis Date: **4/24/2018 03:31 PM**

Client ID: Run ID: **HG1_180424A** SeqNo: **4997280** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-117254-117254** Units: **mg/Kg** Analysis Date: **4/24/2018 03:52 PM**

Client ID: Run ID: **HG1_180424A** SeqNo: **4997288** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1583	0.020	0.1665	0	95.1	80-120	0			

MS Sample ID: **1804866-05BMS** Units: **mg/Kg** Analysis Date: **4/24/2018 04:02 PM**

Client ID: Run ID: **HG1_180424A** SeqNo: **4997373** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1793	0.017	0.1433	0.01512	115	75-125	0			

MSD Sample ID: **1804866-05BMSD** Units: **mg/Kg** Analysis Date: **4/24/2018 04:05 PM**

Client ID: Run ID: **HG1_180424A** SeqNo: **4997374** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1819	0.017	0.1431	0.01512	117	75-125	0.1793	1.44	35	

The following samples were analyzed in this batch: 18041363-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041363
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117273** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117273-117273** Units: **mg/Kg** Analysis Date: **4/24/2018 12:43 PM**
Client ID: Run ID: **ICPMS3_180424A** SeqNo: **4997144** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.05905	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117273-117273** Units: **mg/Kg** Analysis Date: **4/24/2018 12:45 PM**
Client ID: Run ID: **ICPMS3_180424A** SeqNo: **4997145** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.5	0.25	5	0	90	80-120	0			
Barium	4.703	0.25	5	0	94.1	80-120	0			
Beryllium	4.541	0.10	5	0	90.8	80-120	0			
Boron	22.56	1.0	25	0	90.2	80-120	0			
Cadmium	4.696	0.10	5	0	93.9	80-120	0			
Lead	4.761	0.25	5	0	95.2	80-120	0			
Lithium	4.797	0.50	5	0	95.9	80-120	0			
Molybdenum	4.666	0.25	5	0	93.3	80-120	0			
Selenium	4.598	0.25	5	0	92	80-120	0			

MS Sample ID: **18041341-02AMS** Units: **mg/Kg** Analysis Date: **4/24/2018 12:50 PM**
Client ID: Run ID: **ICPMS3_180424A** SeqNo: **4997148** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.657	0.38	7.657	1.814	89.4	75-125	0			
Barium	14.23	0.38	7.657	4.572	126	75-125	0			S
Beryllium	7.055	0.15	7.657	0.03681	91.7	75-125	0			
Boron	37.15	1.5	38.28	1.592	92.9	75-125	0			
Cadmium	6.809	0.15	7.657	0.002914	88.9	75-125	0			
Lead	10.24	0.38	7.657	3.23	91.5	75-125	0			
Lithium	12.69	0.77	7.657	2.436	134	75-125	0			S
Molybdenum	8.49	0.38	7.657	0.9929	97.9	75-125	0			
Selenium	6.989	0.38	7.657	0.07661	90.3	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041363
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117273** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18041341-02AMSD** Units: **mg/Kg** Analysis Date: **4/24/2018 12:51 PM**
Client ID: Run ID: **ICPMS3_180424A** SeqNo: **4997149** Prep Date: **4/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.963	0.38	7.657	1.814	93.4	75-125	8.657	3.48	20	
Barium	14.02	0.38	7.657	4.572	123	75-125	14.23	1.46	20	
Beryllium	7.085	0.15	7.657	0.03681	92.1	75-125	7.055	0.426	20	
Boron	36.62	1.5	38.28	1.592	91.5	75-125	37.15	1.46	20	
Cadmium	6.815	0.15	7.657	0.002914	89	75-125	6.809	0.0933	20	
Lead	10.09	0.38	7.657	3.23	89.5	75-125	10.24	1.49	20	
Lithium	10.56	0.77	7.657	2.436	106	75-125	12.69	18.3	20	
Molybdenum	7.796	0.38	7.657	0.9929	88.8	75-125	8.49	8.53	20	
Selenium	6.94	0.38	7.657	0.07661	89.6	75-125	6.989	0.704	20	

The following samples were analyzed in this batch: 18041363-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041363
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117654** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117654-117654** Units: **mg/L** Analysis Date: **5/1/2018 01:23 PM**
Client ID: Run ID: **ICPMS3_180501A** SeqNo: **5010867** Prep Date: **5/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	ND	0.0050								

LCS Sample ID: **LCS-117654-117654** Units: **mg/L** Analysis Date: **5/1/2018 01:24 PM**
Client ID: Run ID: **ICPMS3_180501A** SeqNo: **5010868** Prep Date: **5/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.09824	0.0050	0.1	0	98.2	80-120	0			

MS Sample ID: **18041623-04AMS** Units: **mg/L** Analysis Date: **5/1/2018 01:43 PM**
Client ID: Run ID: **ICPMS3_180501A** SeqNo: **5010880** Prep Date: **5/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	1.036	0.050	1	0.00057	104	75-125	0			

MSD Sample ID: **18041623-04AMSD** Units: **mg/L** Analysis Date: **5/1/2018 01:45 PM**
Client ID: Run ID: **ICPMS3_180501A** SeqNo: **5010881** Prep Date: **5/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	1.051	0.050	1	0.00057	105	75-125	1.036	1.47	20	

The following samples were analyzed in this batch: 18041363-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041363
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117393** Instrument ID **IC3** Method: **SW9056A**

MBLK Sample ID: **MBLK-117393-117393** Units: **mg/Kg** Analysis Date: **4/25/2018 10:58 AM**
Client ID: Run ID: **IC3_180425A** SeqNo: **4999329** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

LCS Sample ID: **LCS-117393-117393** Units: **mg/Kg** Analysis Date: **4/25/2018 10:39 AM**
Client ID: Run ID: **IC3_180425A** SeqNo: **4999328** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	96.79	10	100	0	96.8	80-120	0			

MS Sample ID: **18041363-01A MS** Units: **mg/Kg** Analysis Date: **4/25/2018 11:36 AM**
Client ID: **4030** Run ID: **IC3_180425A** SeqNo: **4999331** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	123.7	9.7	97.47	32.23	93.8	75-125	0			

MSD Sample ID: **18041363-01A MSD** Units: **mg/Kg** Analysis Date: **4/25/2018 11:56 AM**
Client ID: **4030** Run ID: **IC3_180425A** SeqNo: **4999332** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	121.3	10	99.6	32.23	89.4	75-125	123.7	1.93	20	

The following samples were analyzed in this batch: 18041363-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041363
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R234462** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **MB-R234462-R234462** Units: **% of sample** Analysis Date: **4/24/2018 11:35 AM**
Client ID: Run ID: **MOIST_180424A** SeqNo: **4997321** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R234462-R234462** Units: **% of sample** Analysis Date: **4/24/2018 11:35 AM**
Client ID: Run ID: **MOIST_180424A** SeqNo: **4997322** 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: **18041363-01A DUP** Units: **% of sample** Analysis Date: **4/24/2018 11:35 AM**
Client ID: **4030** Run ID: **MOIST_180424A** SeqNo: **4997324** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	13.78	0.050	0	0	0	0-0	13.27	3.77	10	

The following samples were analyzed in this batch: 18041363-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39333

ALS Project Manager: | ALS Work Order #: 1804363

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung LYAP	A	See attached
Work Order		Project Number	133.17.001	B	
Company Name	engineering + environmental solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	400 Beth Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	616-931-3941	Phone		H	
Fax	Amy.Mandrell@goeesolutions.net	Fax		I	
e-Mail Address	Blaine.Litteral@goeesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Preserv.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4030	4/23/18	3:30pm	Soil		1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☑ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell	4/23/18	1643	
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory): DFS	Date: 4/24/18	Time: 0830	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
502	15.8°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **23-Apr-18 16:43**

Work Order: **18041363** Received by: **JW**

Checklist completed by Diane Shaw (eSignature) 24-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 25-Apr-18 (Date)

Matrices: Soil

Carrier name: Client

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):	15.8/15.8 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/24/2018 8:41:44 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:

01-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18041488**

Dear Blaine, Revision: **1**

ALS Environmental received 3 samples on 25-Apr-2018 11:20 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 16.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 01-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18041488**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18041488-01	4083	Soil		4/25/2018 10:00	4/25/2018 11:20	☐
18041488-02	4087	Soil		4/25/2018 09:40	4/25/2018 11:20	☐
18041488-03	4055-Retest	Soil		4/25/2018 09:20	4/25/2018 11:20	☐

ALS Group, USA

Date: 01-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18041488**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

ALS Group, USA

Date: *01-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041488
Sample ID: 4083
Lab ID: 18041488-01
Collection Date: 4/25/2018 10:00 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/26/18 08:35		Analyst: **RSH**
Mercury	ND		0.028	mg/Kg-dry	1	4/26/2018 10:20 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/25/18 14:15		Analyst: **JF**
Arsenic	**3.0**		**0.058**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
Barium	**41**		**0.48**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
Beryllium	**0.33**		**0.19**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
Boron	**11**		**1.9**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
Cadmium	**0.21**		**0.096**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
Lead	**5.8**		**0.48**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
Lithium	**11**		**0.19**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
Molybdenum	**1.9**		**0.48**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
Selenium	**1.4**		**0.096**	**mg/Kg-dry**	1	4/26/2018 02:41 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 5/1/18 14:33		Analyst: **JF**
Selenium	ND		0.0050	mg/L	1	5/1/2018 01:37 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**34**		**0.050**	**% of sample**	1	4/25/2018 02:15 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 4/26/18 16:00		Analyst: **STP**
Sulfate	**16**		**15**	**mg/Kg-dry**	1	4/26/2018 04:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *01-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041488
Sample ID: 4087
Lab ID: 18041488-02
Collection Date: 4/25/2018 09:40 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 4/26/18 08:35		Analyst: **RSH**
Mercury	**0.039**		**0.023**	**mg/Kg-dry**	1	4/26/2018 10:23 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/25/18 14:15		Analyst: **JF**
Arsenic	**5.2**		**0.060**	**mg/Kg-dry**	1	4/26/2018 02:48 AM
Barium	**14**		**0.50**	**mg/Kg-dry**	1	4/26/2018 02:48 AM
Beryllium	ND		0.20	mg/Kg-dry	1	4/26/2018 02:48 AM
Boron	**2.3**		**2.0**	**mg/Kg-dry**	1	4/26/2018 02:48 AM
Cadmium	ND		0.10	mg/Kg-dry	1	4/26/2018 02:48 AM
Lead	**2.8**		**0.50**	**mg/Kg-dry**	1	4/26/2018 02:48 AM
Lithium	**4.5**		**0.20**	**mg/Kg-dry**	1	4/26/2018 02:48 AM
Molybdenum	**15**		**0.50**	**mg/Kg-dry**	1	4/26/2018 02:48 AM
Selenium	**2.7**		**0.10**	**mg/Kg-dry**	1	4/26/2018 02:48 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 5/1/18 14:33		Analyst: **JF**
Selenium	ND		0.0050	mg/L	1	5/1/2018 01:39 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**29**		**0.050**	**% of sample**	1	4/25/2018 02:15 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 4/26/18 16:00		Analyst: **STP**
Sulfate	**51**		**14**	**mg/Kg-dry**	1	4/26/2018 04:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *01-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041488
Sample ID: 4055-Retest
Lab ID: 18041488-03
Collection Date: 4/25/2018 09:20 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/25/18 14:15		Analyst: **JF**
Selenium	**1.7**		**0.077**	**mg/Kg-dry**	1	4/26/2018 02:50 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 5/1/18 14:33		Analyst: **JF**
Selenium	**0.012**		**0.0050**	**mg/L**	1	5/1/2018 01:40 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**13**		**0.050**	**% of sample**	1	4/25/2018 02:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: 01-May-18

Client: Engineering & Environmental Solutions

QC BATCH REPORT

Work Order: 18041488

Project: James DeYoung CYAP

Batch ID: **117417** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-117417-117417**				Units: **mg/Kg**			Analysis Date: **4/26/2018 09:57 AM**			
Client ID:	Run ID: **HG1_180426A**				SeqNo: **5001364**		Prep Date: **4/26/2018**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	ND	0.020									

LCS	Sample ID: **LCS-117417-117417**				Units: **mg/Kg**			Analysis Date: **4/26/2018 10:00 AM**			
Client ID:	Run ID: **HG1_180426A**				SeqNo: **5001365**		Prep Date: **4/26/2018**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.17	0.020	0.1665	0	102	80-120	0				

MS	Sample ID: **18041409-01BMS**				Units: **mg/Kg**			Analysis Date: **4/26/2018 10:05 AM**			
Client ID:	Run ID: **HG1_180426A**				SeqNo: **5001367**		Prep Date: **4/26/2018**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.143	0.016	0.1323	0.01138	99.5	75-125	0				

MSD	Sample ID: **18041409-01BMSD**				Units: **mg/Kg**			Analysis Date: **4/26/2018 10:10 AM**			
Client ID:	Run ID: **HG1_180426A**				SeqNo: **5001368**		Prep Date: **4/26/2018**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1909	0.016	0.1334	0.01138	135	75-125	0.143	28.7	35	S	

The following samples were analyzed in this batch:

18041488-01A	18041488-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041488
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117392** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117392-117392** Units: **mg/Kg** Analysis Date: **4/26/2018 02:36 AM**
Client ID: Run ID: **ICPMS3_180425A** SeqNo: **5001218** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.3584	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117392-117392** Units: **mg/Kg** Analysis Date: **4/26/2018 02:38 AM**
Client ID: Run ID: **ICPMS3_180425A** SeqNo: **5001222** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.811	0.25	5	0	96.2	80-120	0			
Barium	4.87	0.25	5	0	97.4	80-120	0			
Beryllium	4.696	0.10	5	0	93.9	80-120	0			
Boron	23.53	1.0	25	0	94.1	80-120	0			
Cadmium	4.908	0.10	5	0	98.2	80-120	0			
Lead	4.79	0.25	5	0	95.8	80-120	0			
Lithium	4.848	0.50	5	0	97	80-120	0			
Molybdenum	4.907	0.25	5	0	98.1	80-120	0			
Selenium	4.826	0.25	5	0	96.5	80-120	0			

MS Sample ID: **1804630-13BMS** Units: **mg/Kg** Analysis Date: **4/26/2018 02:53 AM**
Client ID: Run ID: **ICPMS3_180425A** SeqNo: **5001231** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.712	0.39	7.849	2.562	91.1	75-125	0			
Barium	36.45	0.39	7.849	21.8	187	75-125	0			S
Beryllium	8.021	0.16	7.849	0.2739	98.7	75-125	0			
Boron	49.71	1.6	39.25	4.683	115	75-125	0			
Cadmium	7.024	0.16	7.849	0	89.5	75-125	0			
Lead	15.57	0.39	7.849	7.975	96.7	75-125	0			
Lithium	22.85	0.78	7.849	10.61	156	75-125	0			S
Molybdenum	8.567	0.39	7.849	1.137	94.7	75-125	0			
Selenium	8.551	0.39	7.849	1.268	92.8	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041488
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117392** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **1804630-13BMSD** Units: **mg/Kg** Analysis Date: **4/26/2018 02:55 AM**
Client ID: Run ID: **ICPMS3_180425A** SeqNo: **5001232** Prep Date: **4/25/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.314	0.39	7.825	2.562	86.3	75-125	9.712	4.18	20	
Barium	32.72	0.39	7.825	21.8	140	75-125	36.45	10.8	20	S
Beryllium	7.461	0.16	7.825	0.2739	91.8	75-125	8.021	7.23	20	
Boron	47	1.6	39.12	4.683	108	75-125	49.71	5.61	20	
Cadmium	6.627	0.16	7.825	0	84.7	75-125	7.024	5.81	20	
Lead	13.95	0.39	7.825	7.975	76.3	75-125	15.57	11	20	
Lithium	19.88	0.78	7.825	10.61	118	75-125	22.85	13.9	20	
Molybdenum	8.154	0.39	7.825	1.137	89.7	75-125	8.567	4.95	20	
Selenium	8.386	0.39	7.825	1.268	91	75-125	8.551	1.94	20	

The following samples were analyzed in this batch:

18041488-01A	18041488-02A	18041488-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041488
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117654** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117654-117654** Units: **mg/L** Analysis Date: **5/1/2018 01:23 PM**
Client ID: Run ID: **ICPMS3_180501A** SeqNo: **5010867** Prep Date: **5/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	ND	0.0050								

LCS Sample ID: **LCS-117654-117654** Units: **mg/L** Analysis Date: **5/1/2018 01:24 PM**
Client ID: Run ID: **ICPMS3_180501A** SeqNo: **5010868** Prep Date: **5/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.09824	0.0050	0.1	0	98.2	80-120	0			

MS Sample ID: **18041623-04AMS** Units: **mg/L** Analysis Date: **5/1/2018 01:43 PM**
Client ID: Run ID: **ICPMS3_180501A** SeqNo: **5010880** Prep Date: **5/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	1.036	0.050	1	0.00057	104	75-125	0			

MSD Sample ID: **18041623-04AMSD** Units: **mg/L** Analysis Date: **5/1/2018 01:45 PM**
Client ID: Run ID: **ICPMS3_180501A** SeqNo: **5010881** Prep Date: **5/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	1.051	0.050	1	0.00057	105	75-125	1.036	1.47	20	

The following samples were analyzed in this batch:

18041488-01A	18041488-02A	18041488-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041488
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117479** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-117479-117479** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002727** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

MS Sample ID: **18041266-10AMS** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002736** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	52.5	9.7	487.3	-4.989	11.8	75-125	0			S

MS Sample ID: **18041266-11AMS** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002739** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	56.08	9.7	487.3	-5.285	12.6	75-125	0			S

MS Sample ID: **18041266-12AMS** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002742** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	56.51	9.7	487.3	-4.133	12.4	75-125	0			S

MSD Sample ID: **18041266-10AMSD** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002737** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	45.56	9.8	489.2	-4.989	10.3	75-125	52.5	14.2	20	S

MSD Sample ID: **18041266-11AMSD** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002740** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	45.03	9.8	489.2	-5.285	10.3	75-125	56.08	21.9	20	SR

MSD Sample ID: **18041266-12AMSD** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002743** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	47.86	9.8	489.2	-4.133	10.6	75-125	56.51	16.6	20	S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041488
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117479** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

LCS1 Sample ID: **LCS1-117479-117479** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002746** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	108.1	10	100	0	108	80-120	0			

LCS2 Sample ID: **LCS2-117479-117479** Units: **mg/Kg** Analysis Date: **4/26/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180426B** SeqNo: **5002747** Prep Date: **4/26/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	546.3	10	500	0	109	80-120	0			

The following samples were analyzed in this batch:

18041488-01A	18041488-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18041488
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R234599** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R234599** Units: **% of sample** Analysis Date: **4/25/2018 02:15 PM**
Client ID: Run ID: **MOIST_180425B** SeqNo: **5001418** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R234599** Units: **% of sample** Analysis Date: **4/25/2018 02:15 PM**
Client ID: Run ID: **MOIST_180425B** SeqNo: **5001417** 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: **18041170-23B DUP** Units: **% of sample** Analysis Date: **4/25/2018 02:15 PM**
Client ID: Run ID: **MOIST_180425B** SeqNo: **5001400** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	8.79	0.050	0	0	0	0-0	9.68	9.64	10	

DUP Sample ID: **18041185-04B DUP** Units: **% of sample** Analysis Date: **4/25/2018 02:15 PM**
Client ID: Run ID: **MOIST_180425B** SeqNo: **5001412** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	9.52	0.050	0	0	0	0-0	9.91	4.01	10	

The following samples were analyzed in this batch:

18041488-01A	18041488-02A	18041488-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39331

ALS Project Manager: | ALS Work Order #: 18041488

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CAP	A	See attached
Work Order		Project Number	133-17-001	B	Selenium
Company Name	Engineering + environmental solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	616-931-3967	Phone		H	
Fax	Blaine.Litteral@goelsolutions.net	Fax		I	
e-Mail Address	Amy.Mandrell@goelsolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4083	4/25	10:00	Soil		1	X										
2	4087	↓	9:40	↓		1	X										
3	4055-retest	↓	9:20	↓		1		X									
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☑ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell	4/25	1120	
Relinquished by:	Date: 4/25/18	Time: 1120	Received by (Laboratory):
Logged by (Laboratory): KE	Date: 4/25/18	Time: 1125	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SF2	18.6°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **25-Apr-18 11:20**

Work Order: **18041488** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 25-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 25-Apr-18 (Date)

Matrices: Soil
Carrier name: Client

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):	10.6/10.6 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/25/2018 11:22:53 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:

02-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18041799**

Dear Blaine,

ALS Environmental received 1 sample on 30-Apr-2018 11:40 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 02-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18041799**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18041799-01	4104	Soil		4/30/2018 11:10	4/30/2018 11:40	☐

ALS Group, USA

Date: 02-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18041799**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *02-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18041799
Sample ID: 4104
Lab ID: 18041799-01
Collection Date: 4/30/2018 11:10 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/1/18 13:28		Analyst: **RSH**
Mercury	**0.024**		**0.022**	**mg/Kg-dry**	1	5/1/2018 01:47 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 4/30/18 14:26		Analyst: **JF**
Arsenic	**2.0**		**0.057**	**mg/Kg-dry**	1	4/30/2018 05:44 PM
Barium	**17**		**0.48**	**mg/Kg-dry**	1	4/30/2018 05:44 PM
Beryllium	**0.75**		**0.19**	**mg/Kg-dry**	1	4/30/2018 05:44 PM
Boron	**5.1**		**1.9**	**mg/Kg-dry**	1	4/30/2018 05:44 PM
Cadmium	ND		0.095	mg/Kg-dry	1	4/30/2018 05:44 PM
Lead	**3.0**		**0.48**	**mg/Kg-dry**	1	4/30/2018 05:44 PM
Lithium	**4.2**		**0.19**	**mg/Kg-dry**	1	4/30/2018 05:44 PM
Molybdenum	ND		0.48	mg/Kg-dry	1	4/30/2018 05:44 PM
Selenium	**1.3**		**0.095**	**mg/Kg-dry**	1	4/30/2018 05:44 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**21**		**0.050**	**% of sample**	1	5/1/2018 10:10 AM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 4/30/18 15:55		Analyst: **STP**
Sulfate	**310**	x	**13**	**mg/Kg-dry**	1	4/30/2018 04:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 02-May-18

Client: Engineering & Environmental Solutions

Work Order: 18041799

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117677** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-117677-117677**			Units: **mg/Kg**			Analysis Date: **5/1/2018 01:39 PM**			
Client ID:	Run ID: **HG1_180501A**			SeqNo: **5011431**			Prep Date: **5/1/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-117677-117677**			Units: **mg/Kg**			Analysis Date: **5/1/2018 01:44 PM**			
Client ID:	Run ID: **HG1_180501A**			SeqNo: **5011432**			Prep Date: **5/1/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.165	0.020	0.1665	0	99.1	80-120	0			

MS	Sample ID: **18041799-01AMS**			Units: **mg/Kg**			Analysis Date: **5/1/2018 01:58 PM**			
Client ID: **4104**	Run ID: **HG1_180501A**			SeqNo: **5011437**			Prep Date: **5/1/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1667	0.017	0.1448	0.01935	102	75-125	0			

MSD	Sample ID: **18041799-01AMSD**			Units: **mg/Kg**			Analysis Date: **5/1/2018 02:00 PM**			
Client ID: **4104**	Run ID: **HG1_180501A**			SeqNo: **5011438**			Prep Date: **5/1/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1774	0.017	0.1435	0.01935	110	75-125	0.1667	6.26	35	

The following samples were analyzed in this batch: 18041799-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041799
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117607** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117607-117607** Units: **mg/Kg** Analysis Date: **4/30/2018 05:15 PM**
Client ID: Run ID: **ICPMS3_180430A** SeqNo: **5010154** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	ND	1.0								
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117607-117607** Units: **mg/Kg** Analysis Date: **4/30/2018 05:16 PM**
Client ID: Run ID: **ICPMS3_180430A** SeqNo: **5010155** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.955	0.25	5	0	99.1	80-120	0			
Barium	5.1	0.25	5	0	102	80-120	0			
Beryllium	4.927	0.10	5	0	98.5	80-120	0			
Boron	24.24	1.0	25	0	96.9	80-120	0			
Cadmium	5.142	0.10	5	0	103	80-120	0			
Lead	5.129	0.25	5	0	103	80-120	0			
Lithium	5.187	0.50	5	0	104	80-120	0			
Molybdenum	5.153	0.25	5	0	103	80-120	0			
Selenium	5.155	0.25	5	0	103	80-120	0			

MS Sample ID: **18041648-02CMS** Units: **mg/Kg** Analysis Date: **4/30/2018 05:23 PM**
Client ID: Run ID: **ICPMS3_180430A** SeqNo: **5010159** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	12.47	0.38	7.553	5.139	97	75-125	0			
Barium	82.06	0.38	7.553	56.85	334	75-125	0			SO
Beryllium	7.91	0.15	7.553	0.4386	98.9	75-125	0			
Boron	34.54	1.5	37.76	0.3661	90.5	75-125	0			
Cadmium	6.835	0.15	7.553	0.01035	90.4	75-125	0			
Lead	29.59	0.38	7.553	17.9	155	75-125	0			S
Lithium	14.35	0.76	7.553	3.545	143	75-125	0			S
Molybdenum	7.553	0.38	7.553	0.6743	91.1	75-125	0			
Selenium	8.505	0.38	7.553	2.053	85.4	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041799
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117607** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18041648-02CMSD** Units: **mg/Kg** Analysis Date: **4/30/2018 05:25 PM**
Client ID: Run ID: **ICPMS3_180430A** SeqNo: **5010160** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.24	0.38	7.53	5.139	81.1	75-125	12.47	10.3	20	
Barium	73.93	0.38	7.53	56.85	227	75-125	82.06	10.4	20	SO
Beryllium	7.66	0.15	7.53	0.4386	95.9	75-125	7.91	3.21	20	
Boron	33.42	1.5	37.65	0.3661	87.8	75-125	34.54	3.29	20	
Cadmium	6.752	0.15	7.53	0.01035	89.5	75-125	6.835	1.22	20	
Lead	24.36	0.38	7.53	17.9	85.8	75-125	29.59	19.4	20	
Lithium	14.28	0.75	7.53	3.545	143	75-125	14.35	0.523	20	S
Molybdenum	7.225	0.38	7.53	0.6743	87	75-125	7.553	4.43	20	
Selenium	8.016	0.38	7.53	2.053	79.2	75-125	8.505	5.92	20	

The following samples were analyzed in this batch: 18041799-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041799
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117620** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-117620-117620** Units: **mg/Kg** Analysis Date: **4/30/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180430B** SeqNo: **5009440** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	3.569	10								Jx

MS Sample ID: **18041262-01AMS** Units: **mg/Kg** Analysis Date: **4/30/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180430B** SeqNo: **5009442** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	69.89	9.9	494.1	2.496	13.6	75-125	0			Sx

MSD Sample ID: **18041262-01AMSD** Units: **mg/Kg** Analysis Date: **4/30/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180430B** SeqNo: **5009443** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	81.02	9.7	486.4	2.496	16.1	75-125	69.89	14.7	20	Sx

LCS1 Sample ID: **LCS1-117620-117620** Units: **mg/Kg** Analysis Date: **4/30/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180430B** SeqNo: **5009462** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	103.3	10	100	0	103	80-120	0			x

LCS2 Sample ID: **LCS2-117620-117620** Units: **mg/Kg** Analysis Date: **4/30/2018 04:00 PM**
Client ID: Run ID: **GALLERY_180430B** SeqNo: **5009463** Prep Date: **4/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	525.1	10	500	0	105	80-120	0			x

The following samples were analyzed in this batch: 18041799-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18041799
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R235000** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **MB-R235000-R235000** Units: **% of sample** Analysis Date: **5/1/2018 10:10 AM**
Client ID: Run ID: **MOIST_180501A** SeqNo: **5011678** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R235000-R235000** Units: **% of sample** Analysis Date: **5/1/2018 10:10 AM**
Client ID: Run ID: **MOIST_180501A** SeqNo: **5011679** 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: **18041799-01A DUP** Units: **% of sample** Analysis Date: **5/1/2018 10:10 AM**
Client ID: **4104** Run ID: **MOIST_180501A** SeqNo: **5011681** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	21.85	0.050	0	0	0	0-0	20.81	4.88	10	

The following samples were analyzed in this batch: 18041799-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39479

ALS Project Manager: | ALS Work Order #: 1804799

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung (4A)	A	see attached
Work Order		Project Number	133-17-001	B	
Company Name	engineering + environmental solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral + Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	616-931-3967	Phone		H	
Fax		Fax		I	
e-Mail Address	Blaine.litteral@geesolutions.net amy.mandrell@geesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4104	4/30	11:10	Soil		1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell	4/30		
Relinquished by:	Date:	Time:	Received by (Laboratory):
—	4/30/18	1140	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):
DFS	4/30/18	1230	

Notes:

Cooler ID	Cooler Temp
502	15.2°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **30-Apr-18 11:40**

Work Order: **18041799** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 30-Apr-18 (Date) Reviewed by: Bill Carey (eSignature) 30-Apr-18 (Date)

Matrices: Soil

Carrier name: Client

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):	15.2/15.2 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/30/2018 12:26:49 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:

03-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **1805076**

Dear Blaine,

ALS Environmental received 6 samples on 02-May-2018 08:23 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 15.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 03-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **1805076**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1805076-01	4094	Soil		5/1/2018 15:15	5/2/2018 08:23	☐
1805076-02	4075	Soil		5/1/2018 15:45	5/2/2018 08:23	☐
1805076-03	4055 - retest 2	Soil		5/1/2018 17:25	5/2/2018 08:23	☐
1805076-04	4055 - retest 2	Splp Extract		5/1/2018 17:25	5/2/2018 08:23	☐
1805076-05	4030 - retest	Soil		5/1/2018 18:30	5/2/2018 08:23	☐
1805076-06	4030 - retest	Splp Extract		5/1/2018 18:30	5/2/2018 08:23	☐

ALS Group, USA

Date: 03-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **1805076**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *03-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805076
Sample ID: 4094
Lab ID: 1805076-01
Collection Date: 5/1/2018 03:15 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/3/18 10:45		Analyst: **RSH**
Mercury	ND		0.019	mg/Kg-dry	1	5/3/2018 11:24 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/2/18 13:27		Analyst: **JF**
Arsenic	**1.6**		**0.054**	**mg/Kg-dry**	1	5/2/2018 08:15 PM
Barium	**12**		**0.45**	**mg/Kg-dry**	1	5/2/2018 08:15 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/2/2018 08:15 PM
Boron	**2.2**		**1.8**	**mg/Kg-dry**	1	5/2/2018 08:15 PM
Cadmium	ND		0.090	mg/Kg-dry	1	5/2/2018 08:15 PM
Lead	**1.9**		**0.45**	**mg/Kg-dry**	1	5/2/2018 08:15 PM
Lithium	**2.2**		**0.18**	**mg/Kg-dry**	1	5/2/2018 08:15 PM
Molybdenum	**2.5**		**0.45**	**mg/Kg-dry**	1	5/2/2018 08:15 PM
Selenium	**0.56**		**0.090**	**mg/Kg-dry**	1	5/2/2018 08:15 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**11**		**0.050**	**% of sample**	1	5/2/2018 04:15 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/3/18 14:15		Analyst: **STP**
Sulfate	**130**		**11**	**mg/Kg-dry**	1	5/3/2018 02:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *03-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805076
Sample ID: 4075
Lab ID: 1805076-02
Collection Date: 5/1/2018 03:45 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/3/18 10:45		Analyst: **RSH**
Mercury	ND		0.020	mg/Kg-dry	1	5/3/2018 11:27 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/2/18 13:27		Analyst: **JF**
Arsenic	**2.9**		**0.057**	**mg/Kg-dry**	1	5/2/2018 08:17 PM
Barium	**14**		**0.47**	**mg/Kg-dry**	1	5/2/2018 08:17 PM
Beryllium	ND		0.19	mg/Kg-dry	1	5/2/2018 08:17 PM
Boron	**2.4**		**1.9**	**mg/Kg-dry**	1	5/2/2018 08:17 PM
Cadmium	ND		0.094	mg/Kg-dry	1	5/2/2018 08:17 PM
Lead	**3.7**		**0.47**	**mg/Kg-dry**	1	5/2/2018 08:17 PM
Lithium	**2.9**		**0.19**	**mg/Kg-dry**	1	5/2/2018 08:17 PM
Molybdenum	**2.8**		**0.47**	**mg/Kg-dry**	1	5/2/2018 08:17 PM
Selenium	**0.85**		**0.094**	**mg/Kg-dry**	1	5/2/2018 08:17 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**16**		**0.050**	**% of sample**	1	5/2/2018 04:15 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/3/18 14:15		Analyst: **STP**
Sulfate	**38**		**12**	**mg/Kg-dry**	1	5/3/2018 02:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *03-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805076
Sample ID: 4055 - retest 2
Lab ID: 1805076-03
Collection Date: 5/1/2018 05:25 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/2/18 13:27		Analyst: **JF**
Selenium	**4.5**		**0.096**	**mg/Kg-dry**	1	5/2/2018 08:19 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**19**		**0.050**	**% of sample**	1	5/2/2018 04:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *03-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805076
Sample ID: 4030 - retest
Lab ID: 1805076-05
Collection Date: 5/1/2018 06:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/2/18 13:27		Analyst: **JF**
Selenium	**3.0**		**0.089**	**mg/Kg-dry**	1	5/2/2018 08:20 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**12**		**0.050**	**% of sample**	1	5/2/2018 04:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 03-May-18

Client: Engineering & Environmental Solutions

Work Order: 1805076

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117799** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-117799-117799**			Units: **mg/Kg**			Analysis Date: **5/3/2018 11:19 AM**			
Client ID:	Run ID: **HG1_180503A**			SeqNo: **5015807**			Prep Date: **5/3/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-117799-117799**			Units: **mg/Kg**			Analysis Date: **5/3/2018 11:21 AM**			
Client ID:	Run ID: **HG1_180503A**			SeqNo: **5015808**			Prep Date: **5/3/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1958	0.020	0.1665	0	118	80-120	0			

MS	Sample ID: **1805091-01AMS**			Units: **mg/Kg**			Analysis Date: **5/3/2018 11:34 AM**			
Client ID:	Run ID: **HG1_180503A**			SeqNo: **5015813**			Prep Date: **5/3/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1654	0.018	0.1469	0.02056	98.6	75-125	0			

MSD	Sample ID: **1805091-01AMSD**			Units: **mg/Kg**			Analysis Date: **5/3/2018 11:37 AM**			
Client ID:	Run ID: **HG1_180503A**			SeqNo: **5015814**			Prep Date: **5/3/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1709	0.018	0.1491	0.02056	101	75-125	0.1654	3.24	35	

The following samples were analyzed in this batch: 1805076-01A 1805076-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805076
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117740** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117740-117740** Units: **mg/Kg** Analysis Date: **5/2/2018 07:23 PM**
Client ID: Run ID: **ICPMS3_180502A** SeqNo: **5014824** Prep Date: **5/2/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

MBLK Sample ID: **MBLK-117740-117740** Units: **mg/Kg** Analysis Date: **5/3/2018 01:05 PM**
Client ID: Run ID: **ICPMS3_180503A** SeqNo: **5016159** Prep Date: **5/2/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Boron	0.0846	1.0								J

LCS Sample ID: **LCS-117740-117740** Units: **mg/Kg** Analysis Date: **5/2/2018 07:25 PM**
Client ID: Run ID: **ICPMS3_180502A** SeqNo: **5014825** Prep Date: **5/2/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.867	0.25	5	0	97.3	80-120	0			
Barium	5.068	0.25	5	0	101	80-120	0			
Beryllium	4.602	0.10	5	0	92	80-120	0			
Boron	24.62	1.0	25	0	98.5	80-120	0			B
Cadmium	5.033	0.10	5	0	101	80-120	0			
Lead	4.933	0.25	5	0	98.7	80-120	0			
Lithium	5.075	0.50	5	0	102	80-120	0			
Molybdenum	5.051	0.25	5	0	101	80-120	0			
Selenium	4.692	0.25	5	0	93.8	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805076
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117740** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **18041357-01BMS** Units: **mg/Kg** Analysis Date: **5/2/2018 07:32 PM**
Client ID: Run ID: **ICPMS3_180502A** SeqNo: **5014829** Prep Date: **5/2/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.69	0.36	7.215	3.939	93.6	75-125	0			
Barium	38.63	0.36	7.215	26.66	166	75-125	0			S
Beryllium	7.282	0.14	7.215	0.1942	98.2	75-125	0			
Boron	43.17	1.4	36.08	7.084	100	75-125	0			B
Cadmium	7.042	0.14	7.215	0.09149	96.3	75-125	0			
Lead	26.1	0.36	7.215	12.75	185	75-125	0			S
Lithium	12.69	0.72	7.215	4.042	120	75-125	0			
Molybdenum	9.848	0.36	7.215	4.517	73.9	75-125	0			S
Selenium	7.172	0.36	7.215	1.032	85.1	75-125	0			

MSD Sample ID: **18041357-01BMSD** Units: **mg/Kg** Analysis Date: **5/2/2018 07:33 PM**
Client ID: Run ID: **ICPMS3_180502A** SeqNo: **5014830** Prep Date: **5/2/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.46	0.36	7.236	3.939	90.2	75-125	10.69	2.16	20	
Barium	34.97	0.36	7.236	26.66	115	75-125	38.63	9.97	20	
Beryllium	7.178	0.14	7.236	0.1942	96.5	75-125	7.282	1.43	20	
Boron	42.01	1.4	36.18	7.084	96.5	75-125	43.17	2.72	20	B
Cadmium	7.057	0.14	7.236	0.09149	96.3	75-125	7.042	0.202	20	
Lead	21.37	0.36	7.236	12.75	119	75-125	26.1	19.9	20	
Lithium	12.24	0.72	7.236	4.042	113	75-125	12.69	3.65	20	
Molybdenum	11.33	0.36	7.236	4.517	94.1	75-125	9.848	14	20	
Selenium	7.497	0.36	7.236	1.032	89.3	75-125	7.172	4.43	20	

The following samples were analyzed in this batch:

1805076-01A 1805076-02A 1805076-03A
1805076-05A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805076
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117820** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-117820-117820** Units: **mg/Kg** Analysis Date: **5/3/2018 02:30 PM**
Client ID: Run ID: **GALLERY_180503A** SeqNo: **5016409** Prep Date: **5/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

MS Sample ID: **1805041-01AMS** Units: **mg/Kg** Analysis Date: **5/3/2018 02:30 PM**
Client ID: Run ID: **GALLERY_180503A** SeqNo: **5016411** Prep Date: **5/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	82.71	9.7	484.5	1.805	16.7	75-125	0			S

MSD Sample ID: **1805041-01AMSD** Units: **mg/Kg** Analysis Date: **5/3/2018 02:30 PM**
Client ID: Run ID: **GALLERY_180503A** SeqNo: **5016412** Prep Date: **5/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	91.43	10	500	1.805	17.9	75-125	82.71	10	20	S

LCS1 Sample ID: **LCS1-117820-117820** Units: **mg/Kg** Analysis Date: **5/3/2018 02:30 PM**
Client ID: Run ID: **GALLERY_180503A** SeqNo: **5016431** Prep Date: **5/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	105.2	10	100	0	105	80-120	0			

LCS2 Sample ID: **LCS2-117820-117820** Units: **mg/Kg** Analysis Date: **5/3/2018 02:30 PM**
Client ID: Run ID: **GALLERY_180503A** SeqNo: **5016432** Prep Date: **5/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	542.8	10	500	0	109	80-120	0			

The following samples were analyzed in this batch: 1805076-01A 1805076-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805076
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R235151** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R235151** Units: **% of sample** Analysis Date: **5/2/2018 04:15 PM**
Client ID: Run ID: **MOIST_180502B** SeqNo: **5015643** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R235151** Units: **% of sample** Analysis Date: **5/2/2018 04:15 PM**
Client ID: Run ID: **MOIST_180502B** SeqNo: **5015642** 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: **1805076-01A DUP** Units: **% of sample** Analysis Date: **5/2/2018 04:15 PM**
Client ID: **4094** Run ID: **MOIST_180502B** SeqNo: **5015624** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	11.83	0.050	0	0	0	0-0	10.87	8.46	10	

DUP Sample ID: **1805076-02A DUP** Units: **% of sample** Analysis Date: **5/2/2018 04:15 PM**
Client ID: **4075** Run ID: **MOIST_180502B** SeqNo: **5015626** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	18.77	0.050	0	0	0	0-0	16.22	14.6	10	R

The following samples were analyzed in this batch:

1805076-01A	1805076-02A	1805076-03A
1805076-05A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39334

ALS Project Manager: | ALS Work Order #: 1805076

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung LMAP	A	See attached
Work Order		Project Number	133-17-001	B	total selenium
Company Name	engineering + environmental solutions	Bill To Company	Holland BPW	C	Selenium SPLP
Send Report To	Blaine Litteral	Invoice Attn	Judy Visscher	D	
Address	Amy Mandrell 400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	616-931-3967	Phone		H	
Fax	Blaine.Litteral@goelesolutions.net	Fax		I	
e-Mail Address	amy.mandrell@goelesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4094	5/1	3:15	Soil		1	X										
2	4075	5/1	3:45	Soil		1	X										
3	4055-retest 2	5/1	5:25	Soil		1		X	X								
4	4030-retest	5/1	6:30	Soil		1		X	X								
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☑ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 5/2	Time: 0823	Received by:	
Relinquished by:	Date:	Time:	Received by (Laboratory):	
Logged by (Laboratory): DES	Date: 5/2/18	Time: 0830	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
SR2	3.0°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-NaHSO4 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **02-May-18 08:23**

Work Order: **1805076** Received by: **JW**

Checklist completed by Diane Shaw (eSignature) 02-May-18 (Date) Reviewed by: Bill Carey (eSignature) 02-May-18 (Date)

Matrices: Soil

Carrier name: Client

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 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/2/2018 8:36:17 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:

08-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **1805399**

Dear Blaine,

ALS Environmental received 1 sample on 07-May-2018 10:46 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 08-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **1805399**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1805399-01	4053	Soil		5/7/2018 09:10	5/7/2018 10:46	☐

ALS Group, USA

Date: 08-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **1805399**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *08-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805399
Sample ID: 4053
Lab ID: 1805399-01
Collection Date: 5/7/2018 09:10 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/8/18 12:12		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	5/8/2018 11:56 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/7/18 12:36		Analyst: **JF**
Arsenic	**2.2**		**0.049**	**mg/Kg-dry**	1	5/7/2018 08:15 PM
Barium	**8.0**		**0.41**	**mg/Kg-dry**	1	5/7/2018 08:15 PM
Beryllium	ND		0.16	mg/Kg-dry	1	5/7/2018 08:15 PM
Boron	**1.7**		**1.6**	**mg/Kg-dry**	1	5/7/2018 08:15 PM
Cadmium	ND		0.081	mg/Kg-dry	1	5/7/2018 08:15 PM
Lead	**1.3**		**0.41**	**mg/Kg-dry**	1	5/7/2018 08:15 PM
Lithium	**1.8**		**0.16**	**mg/Kg-dry**	1	5/7/2018 08:15 PM
Molybdenum	ND		0.41	mg/Kg-dry	1	5/7/2018 08:15 PM
Selenium	**1.6**		**0.081**	**mg/Kg-dry**	1	5/7/2018 08:15 PM
MOISTURE			**SW3550C**			Analyst: **RZM**
Moisture	**4.0**		**0.050**	**% of sample**	1	5/7/2018 05:01 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/7/18 20:45		Analyst: **STP**
Sulfate	**32**		**9.5**	**mg/Kg-dry**	1	5/8/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 08-May-18

Client: Engineering & Environmental Solutions

Work Order: 1805399

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118023** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-118023-118023** Units: **mg/Kg** Analysis Date: **5/8/2018 11:51 AM**

Client ID: Run ID: **HG1_180508A** SeqNo: **5023022** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-118023-118023** Units: **mg/Kg** Analysis Date: **5/8/2018 11:54 AM**

Client ID: Run ID: **HG1_180508A** SeqNo: **5023023** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1333	0.020	0.1665	0	80.1	80-120	0			

MS Sample ID: **1805399-01AMS** Units: **mg/Kg** Analysis Date: **5/8/2018 11:59 AM**

Client ID: **4053** Run ID: **HG1_180508A** SeqNo: **5023027** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1319	0.017	0.1388	0.01208	86.4	75-125	0			

MSD Sample ID: **1805399-01AMSD** Units: **mg/Kg** Analysis Date: **5/8/2018 12:25 PM**

Client ID: **4053** Run ID: **HG1_180508A** SeqNo: **5023275** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1247	0.017	0.1391	0.01208	80.9	75-125	0.1319	5.68	35	

The following samples were analyzed in this batch: 1805399-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805399
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117942** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-117942-117942** Units: **mg/Kg** Analysis Date: **5/7/2018 07:46 PM**
Client ID: Run ID: **ICPMS3_180507A** SeqNo: **5022386** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-117942-117942** Units: **mg/Kg** Analysis Date: **5/7/2018 07:48 PM**
Client ID: Run ID: **ICPMS3_180507A** SeqNo: **5022387** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.893	0.25	5	0	97.9	80-120	0			
Barium	4.887	0.25	5	0	97.7	80-120	0			
Beryllium	4.709	0.10	5	0	94.2	80-120	0			
Cadmium	4.794	0.10	5	0	95.9	80-120	0			
Lead	4.916	0.25	5	0	98.3	80-120	0			
Lithium	4.876	0.50	5	0	97.5	80-120	0			
Molybdenum	4.754	0.25	5	0	95.1	80-120	0			
Selenium	4.802	0.25	5	0	96	80-120	0			

MS Sample ID: **1805209-02AMS** Units: **mg/Kg** Analysis Date: **5/7/2018 07:55 PM**
Client ID: Run ID: **ICPMS3_180507A** SeqNo: **5022391** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	7.848	0.35	6.983	1.317	93.5	75-125	0			
Barium	34.06	0.35	6.983	22.7	163	75-125	0			S
Beryllium	6.699	0.14	6.983	0.131	94	75-125	0			
Cadmium	6.284	0.14	6.983	0.1348	88.1	75-125	0			
Lead	25.31	0.35	6.983	20.83	64.2	75-125	0			S
Lithium	9.558	0.70	6.983	2.027	108	75-125	0			
Molybdenum	7.46	0.35	6.983	0.8752	94.3	75-125	0			
Selenium	6.637	0.35	6.983	0.7336	84.5	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805399
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117942** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **1805209-02AMSD** Units: **mg/Kg** Analysis Date: **5/7/2018 07:56 PM**

Client ID: Run ID: **ICPMS3_180507A** SeqNo: **5022392** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	7.914	0.35	6.954	1.317	94.9	75-125	7.848	0.832	20	
Barium	49.86	0.35	6.954	22.7	390	75-125	34.06	37.6	20	SR
Beryllium	6.756	0.14	6.954	0.131	95.3	75-125	6.699	0.854	20	
Cadmium	6.324	0.14	6.954	0.1348	89	75-125	6.284	0.635	20	
Lead	25.88	0.35	6.954	20.83	72.6	75-125	25.31	2.2	20	S
Lithium	9.656	0.70	6.954	2.027	110	75-125	9.558	1.02	20	
Molybdenum	7.145	0.35	6.954	0.8752	90.2	75-125	7.46	4.31	20	
Selenium	6.862	0.35	6.954	0.7336	88.1	75-125	6.637	3.34	20	

The following samples were analyzed in this batch: 1805399-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805399
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **117973** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-117973-117973** Units: **mg/Kg** Analysis Date: **5/8/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180508B** SeqNo: **5023458** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

MS Sample ID: **1805319-07BMS** Units: **mg/Kg** Analysis Date: **5/8/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180508B** SeqNo: **5023460** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	451	10	499	1.676	90	75-125	0			

MSD Sample ID: **1805319-07BMSD** Units: **mg/Kg** Analysis Date: **5/8/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180508B** SeqNo: **5023461** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	437.7	9.9	494.1	1.676	88.3	75-125	451	2.98	20	

LCS1 Sample ID: **LCS1-117973-117973** Units: **mg/Kg** Analysis Date: **5/8/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180508B** SeqNo: **5023463** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	108.7	10	100	0	109	80-120	0			

LCS2 Sample ID: **LCS2-117973-117973** Units: **mg/Kg** Analysis Date: **5/8/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180508B** SeqNo: **5023464** Prep Date: **5/7/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	543.5	10	500	0	109	80-120	0			

The following samples were analyzed in this batch: 1805399-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805399
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R235450** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R235450** Units: **% of sample** Analysis Date: **5/7/2018 05:01 PM**
Client ID: Run ID: **MOIST_180507A** SeqNo: **5022774** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R235450** Units: **% of sample** Analysis Date: **5/7/2018 05:01 PM**
Client ID: Run ID: **MOIST_180507A** SeqNo: **5022773** 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: **1805399-01A DUP** Units: **% of sample** Analysis Date: **5/7/2018 05:01 PM**
Client ID: **4053** Run ID: **MOIST_180507A** SeqNo: **5022755** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	4.45	0.050	0	0	0	0-0	4.05	9.41	10	

DUP Sample ID: **1805417-07B DUP** Units: **% of sample** Analysis Date: **5/7/2018 05:01 PM**
Client ID: Run ID: **MOIST_180507A** SeqNo: **5022763** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	19.78	0.050	0	0	0	0-0	20.04	1.31	10	

The following samples were analyzed in this batch: 1805399-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39473

ALS Project Manager: | ALS Work Order #: 1805399

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Jamil DeYoung YMP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	engineering + env. solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	4001 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone	616-951-3960	Phone		H	
Fax	blaine.litteral@geesolutions.net	Fax		I	
e-Mail Address	Amy.Mandrell@geesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4053	5/7/18	9:10	Soil		1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy mandrell

Shipment Method

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 5/7/18	Time:	Received by:	
Relinquished by: —	Date: 5/7/18	Time: 1046	Received by (Laboratory):	
Logged by (Laboratory): DFS	Date: 5/7/18	Time: 1215	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
SLZ	18.0°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **07-May-18 10:46**

Work Order: **1805399** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 07-May-18 (Date) Reviewed by: Bill Carey (eSignature) 07-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	18.0/18.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/7/2018 12:26:31 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-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **1805447**

Dear Blaine,

ALS Environmental received 2 samples on 08-May-2018 10:10 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 13.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 09-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **1805447**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1805447-01	4020	Soil		5/8/2018 09:00	5/8/2018 10:10	☐
1805447-02	4005	Soil		5/8/2018 09:10	5/8/2018 10:10	☐

ALS Group, USA

Date: 09-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **1805447**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *09-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805447
Sample ID: 4020
Lab ID: 1805447-01
Collection Date: 5/8/2018 09:00 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/9/18 11:33		Analyst: **RSH**
Mercury	ND		0.018	mg/Kg-dry	1	5/9/2018 12:03 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/8/18 13:15		Analyst: **JF**
Arsenic	**1.1**		**0.047**	**mg/Kg-dry**	1	5/8/2018 06:45 PM
Barium	**21**		**0.39**	**mg/Kg-dry**	1	5/8/2018 06:45 PM
Beryllium	ND		0.16	mg/Kg-dry	1	5/8/2018 06:45 PM
Boron	ND		1.6	mg/Kg-dry	1	5/8/2018 06:45 PM
Cadmium	ND		0.079	mg/Kg-dry	1	5/8/2018 06:45 PM
Lead	**0.82**		**0.39**	**mg/Kg-dry**	1	5/8/2018 06:45 PM
Lithium	**2.3**		**0.16**	**mg/Kg-dry**	1	5/8/2018 06:45 PM
Molybdenum	ND		0.39	mg/Kg-dry	1	5/8/2018 06:45 PM
Selenium	**2.9**		**0.079**	**mg/Kg-dry**	1	5/8/2018 06:45 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**4.8**		**0.050**	**% of sample**	1	5/8/2018 02:20 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/8/18 17:15		Analyst: **STP**
Sulfate	**29**	x	**10**	**mg/Kg-dry**	1	5/9/2018 12:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *09-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805447
Sample ID: 4005
Lab ID: 1805447-02
Collection Date: 5/8/2018 09:10 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/9/18 11:33		Analyst: **RSH**
Mercury	**0.084**		**0.025**	**mg/Kg-dry**	1	5/9/2018 12:06 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/8/18 13:15		Analyst: **JF**
Arsenic	**5.8**		**0.064**	**mg/Kg-dry**	1	5/8/2018 06:57 PM
Barium	**17**		**0.53**	**mg/Kg-dry**	1	5/8/2018 06:57 PM
Beryllium	ND		0.21	mg/Kg-dry	1	5/8/2018 06:57 PM
Boron	**3.9**		**2.1**	**mg/Kg-dry**	1	5/8/2018 06:57 PM
Cadmium	ND		0.11	mg/Kg-dry	1	5/8/2018 06:57 PM
Lead	**4.2**		**0.53**	**mg/Kg-dry**	1	5/8/2018 06:57 PM
Lithium	**4.7**		**0.21**	**mg/Kg-dry**	1	5/8/2018 06:57 PM
Molybdenum	**4.2**		**0.53**	**mg/Kg-dry**	1	5/8/2018 06:57 PM
Selenium	**5.7**		**0.11**	**mg/Kg-dry**	1	5/8/2018 06:57 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**27**		**0.050**	**% of sample**	1	5/8/2018 02:20 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/8/18 17:15		Analyst: **STP**
Sulfate	**110**	x	**14**	**mg/Kg-dry**	1	5/9/2018 12:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 09-May-18

Client: Engineering & Environmental Solutions

Work Order: 1805447

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118092** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-118092-118092** Units: **mg/Kg** Analysis Date: **5/9/2018 11:58 AM**

Client ID: Run ID: **HG1_180509A** SeqNo: **5025236** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-118092-118092** Units: **mg/Kg** Analysis Date: **5/9/2018 12:01 PM**

Client ID: Run ID: **HG1_180509A** SeqNo: **5025237** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1858	0.020	0.1665	0	112	80-120	0			

MS Sample ID: **1805447-02AMS** Units: **mg/Kg** Analysis Date: **5/9/2018 12:08 PM**

Client ID: **4005** Run ID: **HG1_180509A** SeqNo: **5025240** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.2245	0.018	0.1521	0.061	108	75-125	0			

MSD Sample ID: **1805447-02AMSD** Units: **mg/Kg** Analysis Date: **5/9/2018 12:11 PM**

Client ID: **4005** Run ID: **HG1_180509A** SeqNo: **5025241** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1992	0.018	0.1514	0.061	91.3	75-125	0.2245	11.9	35	

The following samples were analyzed in this batch: 1805447-01A 1805447-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805447
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118016** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-118016-118016** Units: **mg/Kg** Analysis Date: **5/8/2018 06:15 PM**
Client ID: Run ID: **ICPMS3_180508A** SeqNo: **5024327** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.1366	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-118016-118016** Units: **mg/Kg** Analysis Date: **5/8/2018 06:16 PM**
Client ID: Run ID: **ICPMS3_180508A** SeqNo: **5024328** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.891	0.25	5	0	97.8	80-120	0			
Barium	4.987	0.25	5	0	99.7	80-120	0			
Beryllium	4.855	0.10	5	0	97.1	80-120	0			
Boron	24.37	1.0	25	0	97.5	80-120	0			
Cadmium	5.174	0.10	5	0	103	80-120	0			
Lead	5.073	0.25	5	0	101	80-120	0			
Lithium	5.117	0.50	5	0	102	80-120	0			
Molybdenum	5.218	0.25	5	0	104	80-120	0			
Selenium	5.086	0.25	5	0	102	80-120	0			

MS Sample ID: **1805447-01AMS** Units: **mg/Kg** Analysis Date: **5/8/2018 06:47 PM**
Client ID: **4020** Run ID: **ICPMS3_180508A** SeqNo: **5024347** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.663	0.38	7.53	1.066	101	75-125	0			
Barium	28.22	0.38	7.53	19.56	115	75-125	0			
Beryllium	7.434	0.15	7.53	0.02991	98.3	75-125	0			
Boron	37.01	1.5	37.65	0.7762	96.2	75-125	0			
Cadmium	7.517	0.15	7.53	0.005922	99.7	75-125	0			
Lead	8.464	0.38	7.53	0.7791	102	75-125	0			
Lithium	10.28	0.75	7.53	2.199	107	75-125	0			
Molybdenum	7.811	0.38	7.53	0.0506	103	75-125	0			
Selenium	10.26	0.38	7.53	2.762	99.5	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805447
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118016** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **1805447-01AMSD** Units: **mg/Kg** Analysis Date: **5/8/2018 06:49 PM**
Client ID: **4020** Run ID: **ICPMS3_180508A** SeqNo: **5024348** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.38	0.37	7.474	1.066	97.9	75-125	8.663	3.32	20	
Barium	28.35	0.37	7.474	19.56	118	75-125	28.22	0.457	20	
Beryllium	7.357	0.15	7.474	0.02991	98	75-125	7.434	1.04	20	
Boron	37.72	1.5	37.37	0.7762	98.9	75-125	37.01	1.91	20	
Cadmium	7.437	0.15	7.474	0.005922	99.4	75-125	7.517	1.07	20	
Lead	8.413	0.37	7.474	0.7791	102	75-125	8.464	0.596	20	
Lithium	10.43	0.75	7.474	2.199	110	75-125	10.28	1.43	20	
Molybdenum	7.685	0.37	7.474	0.0506	102	75-125	7.811	1.63	20	
Selenium	10.09	0.37	7.474	2.762	98.1	75-125	10.26	1.61	20	

The following samples were analyzed in this batch: 1805447-01A 1805447-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805447
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118047** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-118047-118047** Units: **mg/Kg** Analysis Date: **5/9/2018 12:00 PM**
Client ID: Run ID: **GALLERY_180509A** SeqNo: **5025265** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	2.939	10								Jx

MS Sample ID: **1805447-01AMS** Units: **mg/Kg** Analysis Date: **5/9/2018 12:00 PM**
Client ID: **4020** Run ID: **GALLERY_180509A** SeqNo: **5025267** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	531.1	9.8	489.2	27.3	103	75-125	0			x

MSD Sample ID: **1805447-01AMSD** Units: **mg/Kg** Analysis Date: **5/9/2018 12:00 PM**
Client ID: **4020** Run ID: **GALLERY_180509A** SeqNo: **5025268** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	545.5	9.7	487.3	27.3	106	75-125	531.1	2.68	20	x

LCS1 Sample ID: **LCS1-118047-118047** Units: **mg/Kg** Analysis Date: **5/9/2018 12:00 PM**
Client ID: Run ID: **GALLERY_180509A** SeqNo: **5025270** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	102.6	10	100	0	103	80-120	0			x

LCS2 Sample ID: **LCS2-118047-118047** Units: **mg/Kg** Analysis Date: **5/9/2018 12:00 PM**
Client ID: Run ID: **GALLERY_180509A** SeqNo: **5025271** Prep Date: **5/8/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	535.2	10	500	0	107	80-120	0			x

The following samples were analyzed in this batch: 1805447-01A 1805447-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805447
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R235550** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R235550** Units: **% of sample** Analysis Date: **5/8/2018 02:20 PM**
Client ID: Run ID: **MOIST_180508A** SeqNo: **5024976** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R235550** Units: **% of sample** Analysis Date: **5/8/2018 02:20 PM**
Client ID: Run ID: **MOIST_180508A** SeqNo: **5024975** 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: **1805431-03B DUP** Units: **% of sample** Analysis Date: **5/8/2018 02:20 PM**
Client ID: Run ID: **MOIST_180508A** SeqNo: **5024961** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	16.93	0.050	0	0	0	0-0	16.84	0.533	10	

DUP Sample ID: **1805444-02B DUP** Units: **% of sample** Analysis Date: **5/8/2018 02:20 PM**
Client ID: Run ID: **MOIST_180508A** SeqNo: **5024969** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.67	0.050	0	0	0	0-0	17.9	1.29	10	

The following samples were analyzed in this batch: 1805447-01A 1805447-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39381

ALS Project Manager: | ALS Work Order #: 1805447

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CYAP	A	SM attached
Work Order		Project Number	133-17-001	B	
Company Name	EGG + ENV. Solutions	Bill To Company	Holland BPW	C	
Send Report To	Blaine Lithcal, Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th St Bldg 100 Suite 6	Address		E	
City/State/Zip	Holland MI 49424	City/State/Zip		F	
Phone		Phone		G	
Fax	blaine.lithcal@egoesolutions.net	Fax		H	
e-Mail Address	amy.mandrell@egoesolutions.net	e-Mail Address		I	
				J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4020	5/8/18	9:00	Soil		1	X										
2	4005	5/8/18	9:10	Soil		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell	5-8-18	1010	
Relinquished by:	Date: 5/8/18	Time: 1010	Received by (Laboratory):
Logged by (Laboratory): DCS	Date: 5/8/18	Time: 1035	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	14.6°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **08-May-18 10:10**

Work Order: **1805447** Received by: **KRW**

Checklist completed by Diane Shaw (eSignature) 08-May-18 (Date) Reviewed by: Bill Carey (eSignature) 08-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	14.6/14.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/8/2018 10:34:59 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:

11-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **1805582**

Dear Blaine,

ALS Environmental received 2 samples on 09-May-2018 12:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 13.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 11-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **1805582**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1805582-01	4032	Soil		5/9/2018 11:10	5/9/2018 12:00	☐
1805582-02	4180	Soil		5/9/2018 11:20	5/9/2018 12:00	☐

ALS Group, USA

Date: 11-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **1805582**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *11-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805582
Sample ID: 4032
Lab ID: 1805582-01
Collection Date: 5/9/2018 11:10 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/10/18 12:13		Analyst: **RSH**
Mercury	ND		0.020	mg/Kg-dry	1	5/10/2018 12:30 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/9/18 14:20		Analyst: **JF**
Arsenic	**5.3**		**0.046**	**mg/Kg-dry**	1	5/10/2018 12:47 PM
Barium	**7.8**		**0.38**	**mg/Kg-dry**	1	5/10/2018 12:47 PM
Beryllium	ND		0.15	mg/Kg-dry	1	5/10/2018 12:47 PM
Boron	ND		1.5	mg/Kg-dry	1	5/10/2018 12:47 PM
Cadmium	ND		0.077	mg/Kg-dry	1	5/10/2018 12:47 PM
Lead	**1.5**		**0.38**	**mg/Kg-dry**	1	5/10/2018 12:47 PM
Lithium	**2.1**		**0.15**	**mg/Kg-dry**	1	5/10/2018 12:47 PM
Molybdenum	**3.7**		**0.38**	**mg/Kg-dry**	1	5/10/2018 12:47 PM
Selenium	**0.70**		**0.077**	**mg/Kg-dry**	1	5/10/2018 12:47 PM
MOISTURE			**SW3550C**			Analyst: **BAS**
Moisture	**11**		**0.050**	**% of sample**	1	5/9/2018 03:41 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/9/18 19:15		Analyst: **STP**
Sulfate	**150**	x	**11**	**mg/Kg-dry**	1	5/10/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *11-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1805582
Sample ID: 4180
Lab ID: 1805582-02
Collection Date: 5/9/2018 11:20 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/10/18 12:13		Analyst: **RSH**
Mercury	ND		0.020	mg/Kg-dry	1	5/10/2018 12:38 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/9/18 14:20		Analyst: **JF**
Arsenic	**1.1**		**0.051**	**mg/Kg-dry**	1	5/10/2018 12:49 PM
Barium	**8.9**		**0.42**	**mg/Kg-dry**	1	5/10/2018 12:49 PM
Beryllium	ND		0.17	mg/Kg-dry	1	5/10/2018 12:49 PM
Boron	ND		1.7	mg/Kg-dry	1	5/10/2018 12:49 PM
Cadmium	ND		0.084	mg/Kg-dry	1	5/10/2018 12:49 PM
Lead	**2.0**		**0.42**	**mg/Kg-dry**	1	5/10/2018 12:49 PM
Lithium	**2.1**		**0.17**	**mg/Kg-dry**	1	5/10/2018 12:49 PM
Molybdenum	ND		0.42	mg/Kg-dry	1	5/10/2018 12:49 PM
Selenium	**0.46**		**0.084**	**mg/Kg-dry**	1	5/10/2018 12:49 PM
MOISTURE			**SW3550C**			Analyst: **BAS**
Moisture	**4.0**		**0.050**	**% of sample**	1	5/9/2018 03:41 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/9/18 19:15		Analyst: **STP**
Sulfate	ND	x	10	mg/Kg-dry	1	5/10/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 11-May-18

Client: Engineering & Environmental Solutions

Work Order: 1805582

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118162** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-118162-118162** Units: **mg/Kg** Analysis Date: **5/10/2018 12:25 PM**

Client ID: Run ID: **HG1_180510A** SeqNo: **5027490** Prep Date: **5/10/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-118162-118162** Units: **mg/Kg** Analysis Date: **5/10/2018 12:28 PM**

Client ID: Run ID: **HG1_180510A** SeqNo: **5027491** Prep Date: **5/10/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.185	0.020	0.1665	0	111	80-120	0			

MS Sample ID: **1805582-01AMS** Units: **mg/Kg** Analysis Date: **5/10/2018 12:33 PM**

Client ID: **4032** Run ID: **HG1_180510A** SeqNo: **5027493** Prep Date: **5/10/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1779	0.018	0.1463	0.002907	120	75-125	0			

MSD Sample ID: **1805582-01AMSD** Units: **mg/Kg** Analysis Date: **5/10/2018 12:35 PM**

Client ID: **4032** Run ID: **HG1_180510A** SeqNo: **5027495** Prep Date: **5/10/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.177	0.017	0.1444	0.002907	121	75-125	0.1779	0.489	35	

The following samples were analyzed in this batch: 1805582-01A 1805582-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805582
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118101** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-118101-118101** Units: **mg/Kg** Analysis Date: **5/10/2018 12:44 PM**
Client ID: Run ID: **ICPMS3_180510A** SeqNo: **5027183** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.047	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-118101-118101** Units: **mg/Kg** Analysis Date: **5/10/2018 12:46 PM**
Client ID: Run ID: **ICPMS3_180510A** SeqNo: **5027184** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.805	0.25	5	0	96.1	80-120	0			
Barium	4.737	0.25	5	0	94.7	80-120	0			
Beryllium	4.875	0.10	5	0	97.5	80-120	0			
Boron	24.01	1.0	25	0	96	80-120	0			
Cadmium	4.797	0.10	5	0	95.9	80-120	0			
Lead	4.854	0.25	5	0	97.1	80-120	0			
Lithium	4.896	0.50	5	0	97.9	80-120	0			
Molybdenum	4.996	0.25	5	0	99.9	80-120	0			
Selenium	4.642	0.25	5	0	92.8	80-120	0			

MS Sample ID: **1805582-02AMS** Units: **mg/Kg** Analysis Date: **5/10/2018 12:51 PM**
Client ID: **4180** Run ID: **ICPMS3_180510A** SeqNo: **5027187** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.136	0.40	8.078	1.058	87.6	75-125	0			
Barium	13.71	0.40	8.078	8.533	64.1	75-125	0			S
Beryllium	7.887	0.16	8.078	0.06561	96.8	75-125	0			
Boron	39.04	1.6	40.39	1.333	93.4	75-125	0			
Cadmium	7.097	0.16	8.078	0.02023	87.6	75-125	0			
Lead	9.07	0.40	8.078	1.953	88.1	75-125	0			
Lithium	9.576	0.81	8.078	1.977	94.1	75-125	0			
Molybdenum	7.82	0.40	8.078	0.179	94.6	75-125	0			
Selenium	7.511	0.40	8.078	0.4424	87.5	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805582
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118101** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **1805582-02AMSD** Units: **mg/Kg** Analysis Date: **5/10/2018 12:53 PM**
Client ID: **4180** Run ID: **ICPMS3_180510A** SeqNo: **5027188** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.201	0.41	8.117	1.058	88	75-125	8.136	0.796	20	
Barium	13.74	0.41	8.117	8.533	64.2	75-125	13.71	0.23	20	S
Beryllium	7.919	0.16	8.117	0.06561	96.8	75-125	7.887	0.411	20	
Boron	39.56	1.6	40.58	1.333	94.2	75-125	39.04	1.33	20	
Cadmium	7.026	0.16	8.117	0.02023	86.3	75-125	7.097	1	20	
Lead	9.31	0.41	8.117	1.953	90.6	75-125	9.07	2.62	20	
Lithium	9.656	0.81	8.117	1.977	94.6	75-125	9.576	0.834	20	
Molybdenum	7.845	0.41	8.117	0.179	94.5	75-125	7.82	0.32	20	
Selenium	7.492	0.41	8.117	0.4424	86.9	75-125	7.511	0.25	20	

The following samples were analyzed in this batch: 1805582-01A 1805582-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805582
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118122** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-118122-118122** Units: **mg/Kg** Analysis Date: **5/10/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180510A** SeqNo: **5028175** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	3.574	10								Jx

MS Sample ID: **1805582-01AMS** Units: **mg/Kg** Analysis Date: **5/10/2018 02:00 PM**
Client ID: **4032** Run ID: **GALLERY_180510A** SeqNo: **5028177** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	637.2	9.7	484.5	136.2	103	75-125	0			x

MSD Sample ID: **1805582-01AMSD** Units: **mg/Kg** Analysis Date: **5/10/2018 02:00 PM**
Client ID: **4032** Run ID: **GALLERY_180510A** SeqNo: **5028178** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	644.2	9.9	494.1	136.2	103	75-125	637.2	1.09	20	x

LCS1 Sample ID: **LCS1-118122-118122** Units: **mg/Kg** Analysis Date: **5/10/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180510A** SeqNo: **5028181** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	102.3	10	100	0	102	80-120	0			x

LCS2 Sample ID: **LCS2-118122-118122** Units: **mg/Kg** Analysis Date: **5/10/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180510A** SeqNo: **5028182** Prep Date: **5/9/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	529.6	10	500	0	106	80-120	0			x

The following samples were analyzed in this batch: 1805582-01A 1805582-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1805582
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R235635** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R235635** Units: **% of sample** Analysis Date: **5/9/2018 03:41 PM**
Client ID: Run ID: **MOIST_180509A** SeqNo: **5027335** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R235635** Units: **% of sample** Analysis Date: **5/9/2018 03:41 PM**
Client ID: Run ID: **MOIST_180509A** SeqNo: **5027334** 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: **1805582-01A DUP** Units: **% of sample** Analysis Date: **5/9/2018 03:41 PM**
Client ID: **4032** Run ID: **MOIST_180509A** SeqNo: **5027328** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	6.53	0.050	0	0	0	0-0	11.04	51.3	10	R

DUP Sample ID: **1805582-02A DUP** Units: **% of sample** Analysis Date: **5/9/2018 03:41 PM**
Client ID: **4180** Run ID: **MOIST_180509A** SeqNo: **5027330** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	5.76	0.050	0	0	0	0-0	3.99	36.3	10	R

The following samples were analyzed in this batch: 1805582-01A 1805582-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **09-May-18 12:00**

Work Order: **1805582** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 09-May-18 (Date) Reviewed by: Bill Carey (eSignature) 09-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	18.0/18.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/9/2018 12:37:04 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:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39380

ALS Project Manager: | ALS Work Order #: 1805582

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James Day Dairy CAFO	A	See attached
Work Order	[illegible]	Project Number	133-17-001	B	
Company Name	EES	Bill To Company	Holland BPW	C	
Send Report To	Blaine Literal Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax	Blaine.Literal@eesolutions.net	Fax		I	
e-Mail Address	amy.Mandrell@eesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4032	5/9	11:10	Soil		1	X										
2	4180	5/9	11:20	Soil		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Amy Mandrell	Date: 5/9/18	Time: 1200	Received by:	
Relinquished by:		Date: 5/9/18	Time: 1200	Received by (Laboratory):	
Logged by (Laboratory):	RFS	Date: 5/9/18	Time: 1230	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
SR2	18.0°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

21-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18051210**

Dear Blaine,

ALS Environmental received 4 samples on 17-May-2018 04:45 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 15.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Certificate No: MN 998501

Report of Laboratory Analysis

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18051210**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051210-01	4013	Soil		5/17/2018 14:05	5/17/2018 16:45	☐
18051210-02	4014	Soil		5/17/2018 14:30	5/17/2018 16:45	☐
18051210-03	4232	Soil		5/17/2018 15:30	5/17/2018 16:45	☐
18051210-04	4227	Soil		5/16/2018 16:00	5/17/2018 16:45	☐

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18051210**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051210
Sample ID: 4013
Lab ID: 18051210-01
Collection Date: 5/17/2018 02:05 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/18/18 07:35		Analyst: **RSH**
Mercury	ND		0.020	mg/Kg-dry	1	5/18/2018 10:32 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/18/18 12:26		Analyst: **JF**
Arsenic	**1.5**		**0.055**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
Barium	**5.9**		**0.46**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/18/2018 05:33 PM
Boron	ND		1.8	mg/Kg-dry	1	5/18/2018 05:33 PM
Cadmium	ND		0.091	mg/Kg-dry	1	5/18/2018 05:33 PM
Lead	**1.4**		**0.46**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
Lithium	**2.0**		**0.18**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
Molybdenum	ND		0.46	mg/Kg-dry	1	5/18/2018 05:33 PM
Selenium	**0.95**		**0.091**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**13**		**0.050**	**% of sample**	1	5/17/2018 07:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/17/18 18:30		Analyst: **STP**
Sulfate	**78**		**11**	**mg/Kg-dry**	1	5/18/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051210
Sample ID: 4014
Lab ID: 18051210-02
Collection Date: 5/17/2018 02:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/18/18 07:35		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	5/18/2018 10:35 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/18/18 12:26		Analyst: **JF**
Arsenic	**1.3**		**0.058**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Barium	**6.4**		**0.48**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Beryllium	ND		0.19	mg/Kg-dry	1	5/18/2018 05:40 PM
Boron	**2.0**		**1.9**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Cadmium	ND		0.097	mg/Kg-dry	1	5/18/2018 05:40 PM
Lead	**1.7**		**0.48**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Lithium	**2.1**		**0.19**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Molybdenum	**0.64**		**0.48**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Selenium	**0.49**		**0.097**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**23**		**0.050**	**% of sample**	1	5/17/2018 07:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/17/18 18:30		Analyst: **STP**
Sulfate	**29**		**13**	**mg/Kg-dry**	1	5/18/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051210
Sample ID: 4232
Lab ID: 18051210-03
Collection Date: 5/17/2018 03:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/18/18 07:35		Analyst: **RSH**
Mercury	**0.052**		**0.024**	**mg/Kg-dry**	1	5/18/2018 10:38 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/18/18 12:26		Analyst: **JF**
Arsenic	**2.5**		**0.071**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Barium	**53**		**0.59**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Beryllium	ND		0.24	mg/Kg-dry	1	5/18/2018 05:42 PM
Boron	**7.4**		**2.4**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Cadmium	**0.37**		**0.12**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Lead	**13**		**0.59**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Lithium	**6.9**		**0.24**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Molybdenum	ND		0.59	mg/Kg-dry	1	5/18/2018 05:42 PM
Selenium	**1.3**		**0.12**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**30**		**0.050**	**% of sample**	1	5/17/2018 07:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/17/18 18:30		Analyst: **STP**
Sulfate	ND		14	mg/Kg-dry	1	5/18/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051210
Sample ID: 4227
Lab ID: 18051210-04
Collection Date: 5/16/2018 04:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/18/18 07:35		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	5/18/2018 10:53 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/18/18 12:26		Analyst: **JF**
Arsenic	**0.56**		**0.046**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
Barium	**5.3**		**0.39**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
Beryllium	ND		0.15	mg/Kg-dry	1	5/18/2018 05:44 PM
Boron	ND		1.5	mg/Kg-dry	1	5/18/2018 05:44 PM
Cadmium	ND		0.077	mg/Kg-dry	1	5/18/2018 05:44 PM
Lead	**3.1**		**0.39**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
Lithium	**1.5**		**0.15**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
Molybdenum	ND		0.39	mg/Kg-dry	1	5/18/2018 05:44 PM
Selenium	**0.54**		**0.077**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**10**		**0.050**	**% of sample**	1	5/17/2018 07:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/17/18 18:30		Analyst: **STP**
Sulfate	ND		11	mg/Kg-dry	1	5/18/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions

Work Order: 18051210

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118527** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-118527-118527**			Units: **mg/Kg**			Analysis Date: **5/18/2018 10:27 AM**			
Client ID:	Run ID: **HG1_180518A**			SeqNo: **5040138**			Prep Date: **5/18/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-118527-118527**			Units: **mg/Kg**			Analysis Date: **5/18/2018 10:30 AM**			
Client ID:	Run ID: **HG1_180518A**			SeqNo: **5040139**			Prep Date: **5/18/2018**		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: **18051210-03AMS**			Units: **mg/Kg**			Analysis Date: **5/18/2018 10:48 AM**			
Client ID: **4232**	Run ID: **HG1_180518A**			SeqNo: **5040147**			Prep Date: **5/18/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.2058	0.020	0.1665	0.03604	102	75-125	0			

MSD	Sample ID: **18051210-03AMSD**			Units: **mg/Kg**			Analysis Date: **5/18/2018 10:50 AM**			
Client ID: **4232**	Run ID: **HG1_180518A**			SeqNo: **5040148**			Prep Date: **5/18/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.2792	0.020	0.1665	0.03604	146	75-125	0.2058	30.2	35	S

The following samples were analyzed in this batch:

18051210-01A	18051210-02A	18051210-03A
18051210-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051210
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118554** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-118554-118554** Units: **mg/Kg** Analysis Date: **5/18/2018 04:41 PM**
Client ID: Run ID: **ICPMS3_180518A** SeqNo: **5042693** Prep Date: **5/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	ND	1.0								
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-118554-118554** Units: **mg/Kg** Analysis Date: **5/18/2018 04:43 PM**
Client ID: Run ID: **ICPMS3_180518A** SeqNo: **5042694** Prep Date: **5/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.313	0.25	5	0	106	80-120	0			
Barium	5.46	0.25	5	0	109	80-120	0			
Beryllium	5.184	0.10	5	0	104	80-120	0			
Boron	25.36	1.0	25	0	101	80-120	0			
Cadmium	5.394	0.10	5	0	108	80-120	0			
Lead	5.332	0.25	5	0	107	80-120	0			
Lithium	5.383	0.50	5	0	108	80-120	0			
Molybdenum	5.424	0.25	5	0	108	80-120	0			

MS Sample ID: **18051158-08BMS** Units: **mg/Kg** Analysis Date: **5/18/2018 05:28 PM**
Client ID: Run ID: **ICPMS3_180518A** SeqNo: **5042722** Prep Date: **5/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.522	0.35	6.925	3.326	89.5	75-125	0			
Barium	60.16	0.35	6.925	108.9	-704	75-125	0			SO
Beryllium	6.847	0.14	6.925	0.2177	95.7	75-125	0			
Boron	35.87	1.4	34.63	2.903	95.2	75-125	0			
Cadmium	6.601	0.14	6.925	1.18	78.3	75-125	0			
Lead	69.4	0.35	6.925	75.27	-84.8	75-125	0			SO
Lithium	11.52	0.69	6.925	3.369	118	75-125	0			
Molybdenum	7.169	0.35	6.925	0.4733	96.7	75-125	0			
Selenium	7.006	0.35	6.925	1.06	85.9	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051210
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118554** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18051158-08BMSD** Units: **mg/Kg** Analysis Date: **5/18/2018 05:30 PM**
Client ID: Run ID: **ICPMS3_180518A** SeqNo: **5042723** Prep Date: **5/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.02	0.35	6.925	3.326	82.2	75-125	9.522	5.41	20	
Barium	67.37	0.35	6.925	108.9	-600	75-125	60.16	11.3	20	SO
Beryllium	6.806	0.14	6.925	0.2177	95.1	75-125	6.847	0.599	20	
Boron	36.2	1.4	34.63	2.903	96.2	75-125	35.87	0.908	20	
Cadmium	7.02	0.14	6.925	1.18	84.3	75-125	6.601	6.15	20	
Lead	82.1	0.35	6.925	75.27	98.7	75-125	69.4	16.8	20	O
Lithium	11.46	0.69	6.925	3.369	117	75-125	11.52	0.553	20	
Molybdenum	7.069	0.35	6.925	0.4733	95.2	75-125	7.169	1.41	20	
Selenium	7.032	0.35	6.925	1.06	86.2	75-125	7.006	0.372	20	

The following samples were analyzed in this batch:

18051210-01A	18051210-02A	18051210-03A
18051210-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051210
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118514** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-118514-118514** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040720** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

MS Sample ID: **18051089-02AMS** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040723** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	500.4	9.8	492.1	16.35	98.4	75-125	0			

MSD Sample ID: **18051089-02AMSD** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040724** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	519	9.9	496	16.35	101	75-125	500.4	3.66	20	

LCS1 Sample ID: **LCS1-118514-118514** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040729** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	106.9	10	100	0	107	80-120	0			

LCS2 Sample ID: **LCS2-118514-118514** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040730** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	543.8	10	500	0	109	80-120	0			

The following samples were analyzed in this batch:

18051210-01A	18051210-02A	18051210-03A
18051210-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051210
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R236147** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R236147** Units: **% of sample** Analysis Date: **5/17/2018 07:00 PM**
Client ID: Run ID: **MOIST_180517D** SeqNo: **5040573** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R236147** Units: **% of sample** Analysis Date: **5/17/2018 07:00 PM**
Client ID: Run ID: **MOIST_180517D** SeqNo: **5040572** 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: **18051210-01A DUP** Units: **% of sample** Analysis Date: **5/17/2018 07:00 PM**
Client ID: **4013** Run ID: **MOIST_180517D** SeqNo: **5040552** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	12.61	0.050	0	0	0	0-0	13.36	5.78	10	

DUP Sample ID: **18051210-04A DUP** Units: **% of sample** Analysis Date: **5/17/2018 07:00 PM**
Client ID: **4227** Run ID: **MOIST_180517D** SeqNo: **5040556** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	10.61	0.050	0	0	0	0-0	10.12	4.73	10	

The following samples were analyzed in this batch:

18051210-01A	18051210-02A	18051210-03A
18051210-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39379

ALS Project Manager: | ALS Work Order #: 18051210

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CAPP	A	see attached
Work Order		Project Number	133-17-001	B	
Company Name	FES	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax	blaine.litteral@goeesolutions.net	Fax		I	
e-Mail Address	amy.mandrell@goeesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4013	5.17.18	2:05	Soil		1	X										
2	4014		2:30	Soil		1	X										
3	4232		3:30	Soil		1	X										
4	4227	5.16.18	4:00	Soil		1	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 5/17/18	Time: 1643	Received by:	
Relinquished by:	Date: 5/17/18	Time: 1643	Received by (Laboratory):	
Logged by (Laboratory): KEW	Date: 5/17/18	Time: 1645	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
SW	15.4°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **17-May-18 16:45**

Work Order: **18051210** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 17-May-18 (Date) Reviewed by: Bill Carey (eSignature) 18-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	15.4/15.4 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/17/2018 4:50:02 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-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18051300**

Dear Blaine,

ALS Environmental received 1 sample on 18-May-2018 02:50 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Certificate No: MN 998501

Report of Laboratory Analysis

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18051300**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051300-01	4033	Soil		5/18/2018 14:10	5/18/2018 14:50	☐

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18051300**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051300
Sample ID: 4033
Lab ID: 18051300-01
Collection Date: 5/18/2018 02:10 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/21/18 11:46		Analyst: **RSH**
Mercury	ND		0.019	mg/Kg-dry	1	5/21/2018 12:16 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/21/18 11:35		Analyst: **JF**
Arsenic	**5.1**		**0.053**	**mg/Kg-dry**	1	5/21/2018 12:14 PM
Barium	**6.8**		**0.44**	**mg/Kg-dry**	1	5/21/2018 12:14 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/21/2018 12:14 PM
Boron	**1.8**		**1.8**	**mg/Kg-dry**	1	5/21/2018 12:14 PM
Cadmium	ND		0.089	mg/Kg-dry	1	5/21/2018 12:14 PM
Lead	**1.5**		**0.44**	**mg/Kg-dry**	1	5/21/2018 12:14 PM
Lithium	**2.3**		**0.18**	**mg/Kg-dry**	1	5/21/2018 12:14 PM
Molybdenum	**4.7**		**0.44**	**mg/Kg-dry**	1	5/21/2018 12:14 PM
Selenium	**1.1**		**0.089**	**mg/Kg-dry**	1	5/21/2018 12:14 PM
MOISTURE			**SW3550C**			Analyst: **RZM**
Moisture	**14**		**0.050**	**% of sample**	1	5/18/2018 05:54 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/21/18 11:43		Analyst: **STP**
Sulfate	**160**	x	**11**	**mg/Kg-dry**	1	5/21/2018 11:45 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions

Work Order: 18051300

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118636** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-118636-118636**				Units: **mg/Kg**			Analysis Date: **5/21/2018 12:11 PM**			
Client ID:	Run ID: **HG1_180521A**				SeqNo: **5043599**			Prep Date: **5/21/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	ND	0.020									

LCS	Sample ID: **LCS-118636-118636**				Units: **mg/Kg**			Analysis Date: **5/21/2018 12:13 PM**			
Client ID:	Run ID: **HG1_180521A**				SeqNo: **5043600**			Prep Date: **5/21/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1617	0.020	0.1665	0	97.1	80-120	0				

MS	Sample ID: **18051300-01AMS**				Units: **mg/Kg**			Analysis Date: **5/21/2018 12:18 PM**			
Client ID: **4033**	Run ID: **HG1_180521A**				SeqNo: **5043602**			Prep Date: **5/21/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1445	0.016	0.1368	0.001314	105	75-125	0				

MSD	Sample ID: **18051300-01AMSD**				Units: **mg/Kg**			Analysis Date: **5/21/2018 12:21 PM**			
Client ID: **4033**	Run ID: **HG1_180521A**				SeqNo: **5043603**			Prep Date: **5/21/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Mercury	0.1416	0.016	0.1367	0.001314	103	75-125	0.1445	2.05	35		

The following samples were analyzed in this batch: 18051300-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051300
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118616** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-118616-118616** Units: **mg/Kg** Analysis Date: **5/21/2018 12:10 PM**
Client ID: Run ID: **ICPMS3_180521A** SeqNo: **5043672** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.06835	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-118616-118616** Units: **mg/Kg** Analysis Date: **5/21/2018 12:12 PM**
Client ID: Run ID: **ICPMS3_180521A** SeqNo: **5043673** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.05	0.25	5	0	101	80-120	0			
Barium	4.931	0.25	5	0	98.6	80-120	0			
Beryllium	5.048	0.10	5	0	101	80-120	0			
Boron	24.5	1.0	25	0	98	80-120	0			
Cadmium	4.962	0.10	5	0	99.2	80-120	0			
Lead	4.976	0.25	5	0	99.5	80-120	0			
Lithium	5.128	0.50	5	0	103	80-120	0			
Molybdenum	4.977	0.25	5	0	99.5	80-120	0			
Selenium	4.918	0.25	5	0	98.4	80-120	0			

MS Sample ID: **18051300-01AMS** Units: **mg/Kg** Analysis Date: **5/21/2018 12:15 PM**
Client ID: **4033** Run ID: **ICPMS3_180521A** SeqNo: **5043675** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	12.34	0.39	7.728	4.419	102	75-125	0			
Barium	15.33	0.39	7.728	5.912	122	75-125	0			
Beryllium	7.683	0.15	7.728	0.04048	98.9	75-125	0			
Boron	39.28	1.5	38.64	1.598	97.5	75-125	0			
Cadmium	7.416	0.15	7.728	0.03164	95.6	75-125	0			
Lead	9.201	0.39	7.728	1.315	102	75-125	0			
Lithium	10.83	0.77	7.728	1.953	115	75-125	0			
Molybdenum	11.41	0.39	7.728	4.075	94.9	75-125	0			
Selenium	8.159	0.39	7.728	0.918	93.7	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051300
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118616** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18051300-01AMSD** Units: **mg/Kg** Analysis Date: **5/21/2018 12:17 PM**
Client ID: **4033** Run ID: **ICPMS3_180521A** SeqNo: **5043676** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	12.11	0.38	7.669	4.419	100	75-125	12.34	1.9	20	
Barium	14.76	0.38	7.669	5.912	115	75-125	15.33	3.77	20	
Beryllium	7.616	0.15	7.669	0.04048	98.8	75-125	7.683	0.868	20	
Boron	39.34	1.5	38.34	1.598	98.4	75-125	39.28	0.159	20	
Cadmium	7.459	0.15	7.669	0.03164	96.9	75-125	7.416	0.572	20	
Lead	8.873	0.38	7.669	1.315	98.5	75-125	9.201	3.63	20	
Lithium	10.44	0.77	7.669	1.953	111	75-125	10.83	3.62	20	
Molybdenum	11.42	0.38	7.669	4.075	95.8	75-125	11.41	0.114	20	
Selenium	7.876	0.38	7.669	0.918	90.7	75-125	8.159	3.53	20	

The following samples were analyzed in this batch: 18051300-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051300
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118635** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-118635-118635** Units: **mg/Kg** Analysis Date: **5/21/2018 11:45 AM**
Client ID: Run ID: **GALLERY_180521A** SeqNo: **5043694** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	2.874	10								Jx

MS Sample ID: **18051237-01AMS** Units: **mg/Kg** Analysis Date: **5/21/2018 11:45 AM**
Client ID: Run ID: **GALLERY_180521A** SeqNo: **5043696** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	5339	100	5000	150.9	104	75-125	0			x

MSD Sample ID: **18051237-01AMSD** Units: **mg/Kg** Analysis Date: **5/21/2018 11:45 AM**
Client ID: Run ID: **GALLERY_180521A** SeqNo: **5043697** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	4775	88	4386	150.9	105	75-125	5339	11.2	20	x

LCS1 Sample ID: **LCS1-118635-118635** Units: **mg/Kg** Analysis Date: **5/21/2018 11:45 AM**
Client ID: Run ID: **GALLERY_180521A** SeqNo: **5043704** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	103.6	10	100	0	104	80-120	0			x

LCS2 Sample ID: **LCS2-118635-118635** Units: **mg/Kg** Analysis Date: **5/21/2018 11:45 AM**
Client ID: Run ID: **GALLERY_180521A** SeqNo: **5043705** Prep Date: **5/21/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	528.5	10	500	0	106	80-120	0			x

The following samples were analyzed in this batch: 18051300-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051300
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R236216** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R236216** Units: **% of sample** Analysis Date: **5/18/2018 05:54 PM**
Client ID: Run ID: **MOIST_180518A** SeqNo: **5041827** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R236216** Units: **% of sample** Analysis Date: **5/18/2018 05:54 PM**
Client ID: Run ID: **MOIST_180518A** SeqNo: **5041826** 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: **18051129-01B DUP** Units: **% of sample** Analysis Date: **5/18/2018 05:54 PM**
Client ID: Run ID: **MOIST_180518A** SeqNo: **5041807** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	20.69	0.050	0	0	0	0-0	21.33	3.05	10	

DUP Sample ID: **18051129-02B DUP** Units: **% of sample** Analysis Date: **5/18/2018 05:54 PM**
Client ID: Run ID: **MOIST_180518A** SeqNo: **5041809** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.57	0.050	0	0	0	0-0	19.28	9.28	10	

The following samples were analyzed in this batch: 18051300-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39387

ALS Project Manager: | ALS Work Order #: 1805 1300

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James Deyoung CAP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	EES	Bill To Company	HBPW	C	
Send Report To	Blaine Litteral Amy M.	Invoice Attn	Judy Visscher	D	
Address	400 136th St. Bld 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax	blaine litteral@goeesolutions.net	Fax		I	
e-Mail Address	amy.mandrell@goeesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Prsv.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4033	5.18.18	2:10	soil		1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 5.18.18	Time: 1450	Received by:
Relinquished by:	Date: 5/18/18	Time: 1450	Received by (Laboratory):
Logged by (Laboratory): KE	Date: 5/18/18	Time: 1540	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
502	14.8°c

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **18-May-18 14:50**

Work Order: **18051300** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 18-May-18 (Date) Reviewed by: Bill Carey (eSignature) 18-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	14.8/14.8 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/18/2018 3:40:14 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:

04-Jun-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18051877**

Dear Blaine,

ALS Environmental received 3 samples on 29-May-2018 04:45 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 14.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18051877**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051877-01	4214	Soil		5/29/2018 14:00	5/29/2018 16:45	☐
18051877-02	4172	Soil		5/29/2018 15:00	5/29/2018 16:45	☐
18051877-03	4209	Soil		5/29/2018 16:00	5/29/2018 16:45	☐

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18051877**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051877
Sample ID: 4214
Lab ID: 18051877-01
Collection Date: 5/29/2018 02:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/31/18 10:49		Analyst: **RSH**
Mercury	ND		0.018	mg/Kg-dry	1	5/31/2018 02:31 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/30/18 15:03		Analyst: **JF**
Arsenic	**2.0**		**0.053**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Barium	**11**		**0.44**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/31/2018 01:07 PM
Boron	ND		1.8	mg/Kg-dry	1	6/1/2018 01:28 PM
Cadmium	ND		0.088	mg/Kg-dry	1	5/31/2018 01:07 PM
Lead	**1.2**		**0.44**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Lithium	**3.5**		**0.18**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Molybdenum	**1.6**		**0.44**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Selenium	**0.31**		**0.088**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**17**		**0.050**	**% of sample**	1	5/30/2018 02:20 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/30/18 12:00		Analyst: **STP**
Sulfate	ND		12	mg/Kg-dry	1	5/30/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051877
Sample ID: 4172
Lab ID: 18051877-02
Collection Date: 5/29/2018 03:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/31/18 10:49		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	5/31/2018 02:34 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/30/18 15:03		Analyst: **JF**
Arsenic	**2.1**		**0.054**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Barium	**4.3**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/31/2018 01:09 PM
Boron	**2.0**		**1.8**	**mg/Kg-dry**	1	6/1/2018 01:30 PM
Cadmium	ND		0.089	mg/Kg-dry	1	5/31/2018 01:09 PM
Lead	**0.85**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Lithium	**1.6**		**0.18**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Molybdenum	**2.7**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Selenium	**1.1**		**0.089**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**14**		**0.050**	**% of sample**	1	5/30/2018 02:20 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/30/18 12:00		Analyst: **STP**
Sulfate	ND		12	mg/Kg-dry	1	5/30/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051877
Sample ID: 4209
Lab ID: 18051877-03
Collection Date: 5/29/2018 04:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/31/18 10:49		Analyst: **RSH**
Mercury	ND		0.018	mg/Kg-dry	1	5/31/2018 02:36 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/30/18 15:03		Analyst: **JF**
Arsenic	**1.9**		**0.054**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Barium	**6.2**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/31/2018 01:11 PM
Boron	ND		1.8	mg/Kg-dry	1	5/31/2018 01:11 PM
Cadmium	ND		0.090	mg/Kg-dry	1	5/31/2018 01:11 PM
Lead	**0.80**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Lithium	**1.5**		**0.18**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Molybdenum	**0.61**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Selenium	**1.2**		**0.090**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**16**		**0.050**	**% of sample**	1	5/30/2018 02:20 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/30/18 12:00		Analyst: **STP**
Sulfate	ND		12	mg/Kg-dry	1	5/30/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions

Work Order: 18051877

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119076** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-119076-119076** Units: **mg/Kg** Analysis Date: **5/31/2018 12:46 PM**

Client ID: Run ID: **HG1_180531A** SeqNo: **5064308** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-119076-119076** Units: **mg/Kg** Analysis Date: **5/31/2018 04:48 PM**

Client ID: Run ID: **HG1_180531A** SeqNo: **5064671** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.185	0.020	0.1665	0	111	80-120	0			

MS Sample ID: **18051478-02BMS** Units: **mg/Kg** Analysis Date: **5/31/2018 01:50 PM**

Client ID: Run ID: **HG1_180531A** SeqNo: **5064329** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1808	0.018	0.1537	0.02814	99.3	75-125	0			

MSD Sample ID: **18051478-02BMSD** Units: **mg/Kg** Analysis Date: **5/31/2018 01:53 PM**

Client ID: Run ID: **HG1_180531A** SeqNo: **5064330** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1769	0.018	0.153	0.02814	97.2	75-125	0.1808	2.18	35	

The following samples were analyzed in this batch:

18051877-01A	18051877-02A	18051877-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051877
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119029** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-119029-119029** Units: **mg/L** Analysis Date: **5/31/2018 12:51 PM**
Client ID: Run ID: **ICPMS3_180531A** SeqNo: **5063766** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.9431	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-119029-119029** Units: **mg/L** Analysis Date: **5/31/2018 12:53 PM**
Client ID: Run ID: **ICPMS3_180531A** SeqNo: **5063767** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.857	0.25	5	0	97.1	80-120	0			
Barium	4.95	0.25	5	0	99	80-120	0			
Beryllium	4.947	0.10	5	0	98.9	80-120	0			
Boron	25.21	1.0	25	0	101	80-120	0			
Cadmium	4.917	0.10	5	0	98.3	80-120	0			
Lead	4.92	0.25	5	0	98.4	80-120	0			
Lithium	5.127	0.50	5	0	103	80-120	0			
Molybdenum	4.982	0.25	5	0	99.6	80-120	0			
Selenium	4.825	0.25	5	0	96.5	80-120	0			

MS Sample ID: **18051718-03BMS** Units: **mg/Kg** Analysis Date: **5/31/2018 01:01 PM**
Client ID: Run ID: **ICPMS3_180531A** SeqNo: **5063772** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.25	0.39	7.728	4.001	93.9	75-125	0			
Barium	23.75	0.39	7.728	13.62	131	75-125	0			S
Beryllium	7.753	0.15	7.728	0.1241	98.7	75-125	0			
Boron	43.65	1.5	38.64	5.2	99.5	75-125	0			
Cadmium	6.914	0.15	7.728	0.01667	89.2	75-125	0			
Lead	12.88	0.39	7.728	4.631	107	75-125	0			
Lithium	12.04	0.77	7.728	3.93	105	75-125	0			
Molybdenum	8.083	0.39	7.728	0.8566	93.5	75-125	0			
Selenium	7.274	0.39	7.728	0.6785	85.3	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051877
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119029** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18051718-03BMSD** Units: **mg/Kg** Analysis Date: **5/31/2018 01:03 PM**
Client ID: Run ID: **ICPMS3_180531A** SeqNo: **5063773** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	13.08	0.38	7.68	4.001	118	75-125	11.25	15	20	
Barium	28.4	0.38	7.68	13.62	192	75-125	23.75	17.8	20	S
Beryllium	7.721	0.15	7.68	0.1241	98.9	75-125	7.753	0.406	20	
Boron	45.52	1.5	38.4	5.2	105	75-125	43.65	4.2	20	
Cadmium	6.755	0.15	7.68	0.01667	87.7	75-125	6.914	2.32	20	
Lead	13.32	0.38	7.68	4.631	113	75-125	12.88	3.31	20	
Lithium	13.33	0.77	7.68	3.93	122	75-125	12.04	10.2	20	
Molybdenum	8.174	0.38	7.68	0.8566	95.3	75-125	8.083	1.12	20	
Selenium	7.709	0.38	7.68	0.6785	91.5	75-125	7.274	5.82	20	

The following samples were analyzed in this batch:

18051877-01A	18051877-02A	18051877-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051877
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119027** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-119027-119027** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180530D** SeqNo: **5061965** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

MS Sample ID: **18051877-01AMS** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: **4214** Run ID: **GALLERY_180530D** SeqNo: **5061967** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	510.1	10	500	5.234	101	75-125	0			

MSD Sample ID: **18051877-01AMSD** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: **4214** Run ID: **GALLERY_180530D** SeqNo: **5061968** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	529.3	10	500	5.234	105	75-125	510.1	3.69	20	

LCS1 Sample ID: **LCS1-119027-119027** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180530D** SeqNo: **5061971** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	105.1	10	100	0	105	80-120	0			

LCS2 Sample ID: **LCS2-119027-119027** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180530D** SeqNo: **5061972** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	533.1	10	500	0	107	80-120	0			

The following samples were analyzed in this batch:

18051877-01A	18051877-02A	18051877-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051877
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R236972** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R236972** Units: **% of sample** Analysis Date: **5/30/2018 02:20 PM**
Client ID: Run ID: **MOIST_180530A** SeqNo: **5062687** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R236972** Units: **% of sample** Analysis Date: **5/30/2018 02:20 PM**
Client ID: Run ID: **MOIST_180530A** SeqNo: **5062685** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.99	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **18051877-01A DUP** Units: **% of sample** Analysis Date: **5/30/2018 02:20 PM**
Client ID: **4214** Run ID: **MOIST_180530A** SeqNo: **5062666** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.01	0.050	0	0	0	0-0	16.87	0.826	10	

DUP Sample ID: **18051888-01B DUP** Units: **% of sample** Analysis Date: **5/30/2018 02:20 PM**
Client ID: Run ID: **MOIST_180530A** SeqNo: **5062670** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	19.65	0.050	0	0	0	0-0	20.28	3.16	10	

The following samples were analyzed in this batch:

18051877-01A	18051877-02A	18051877-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 40808

ALS Project Manager: | ALS Work Order #: 1805877

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CYAP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	EES	Bill To Company	HBPW	C	
Send Report To	Blaine Litteral, Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Blaine.Litteral@eesolutions.net amy.mandrell@eesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Preserv.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4214	5.29.18	2pm	Soil		1	X										
2	4172	↓	3pm	↓		1	X										
3	4209		4pm			1	X										
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: AMY Mandrell AMY Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 5.29.18	Time: 1645	Received by:	
Relinquished by:	Date: 5/29/18	Time: 1645	Received by (Laboratory):	
Logged by (Laboratory): DES	Date: 5/30/18	Time: 0830	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
502	13.6°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **29-May-18 16:45**

Work Order: **18051877** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 30-May-18 (Date) Reviewed by: Bill Carey (eSignature) 30-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	13.6/13.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/30/2018 9:10:36 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:

04-Jun-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18051974**

Dear Blaine,

ALS Environmental received 2 samples on 31-May-2018 08:27 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 13.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18051974**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051974-01	4204	Soil		5/30/2018 16:20	5/31/2018 08:27	☐
18051974-02	4169	Soil		5/30/2018 15:50	5/31/2018 08:27	☐

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18051974**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051974
Sample ID: 4204
Lab ID: 18051974-01
Collection Date: 5/30/2018 04:20 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 6/1/18 13:45		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	6/1/2018 01:47 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/31/18 15:47		Analyst: **RH**
Arsenic	**1.1**		**0.056**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
Barium	**11**		**0.47**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
Beryllium	ND		0.19	mg/Kg-dry	1	6/1/2018 10:11 PM
Boron	ND		1.9	mg/Kg-dry	1	6/1/2018 10:11 PM
Cadmium	ND		0.093	mg/Kg-dry	1	6/1/2018 10:11 PM
Lead	**1.3**		**0.47**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
Lithium	**2.5**		**0.19**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
Molybdenum	ND		0.47	mg/Kg-dry	1	6/1/2018 10:11 PM
Selenium	**0.37**		**0.093**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**16**		**0.050**	**% of sample**	1	5/31/2018 01:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 6/1/18 13:55		Analyst: **STP**
Sulfate	**43**	x	**11**	**mg/Kg-dry**	1	6/1/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051974
Sample ID: 4169
Lab ID: 18051974-02
Collection Date: 5/30/2018 03:50 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 6/1/18 13:45		Analyst: **RSH**
Mercury	ND		0.022	mg/Kg-dry	1	6/1/2018 01:50 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/31/18 15:47		Analyst: **RH**
Arsenic	**0.86**		**0.053**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Barium	**3.3**		**0.44**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Beryllium	ND		0.18	mg/Kg-dry	1	6/1/2018 10:12 PM
Boron	ND		1.8	mg/Kg-dry	1	6/1/2018 10:12 PM
Cadmium	ND		0.088	mg/Kg-dry	1	6/1/2018 10:12 PM
Lead	**1.1**		**0.44**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Lithium	**1.3**		**0.18**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Molybdenum	**1.1**		**0.44**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Selenium	**2.4**		**0.088**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**11**		**0.050**	**% of sample**	1	5/31/2018 01:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 6/1/18 13:55		Analyst: **STP**
Sulfate	**14**	x	**11**	**mg/Kg-dry**	1	6/1/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions

Work Order: 18051974

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119173** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-119173-119173** Units: **mg/Kg** Analysis Date: **6/1/2018 01:42 PM**

Client ID: Run ID: **HG1_180601A** SeqNo: **5067296** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-119173-119173** Units: **mg/Kg** Analysis Date: **6/1/2018 01:45 PM**

Client ID: Run ID: **HG1_180601A** SeqNo: **5067299** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1733	0.020	0.1665	0	104	80-120	0			

MS Sample ID: **18051930-03BMS** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**

Client ID: Run ID: **HG1_180601A** SeqNo: **5067317** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1487	0.017	0.1401	0.01827	93.1	75-125	0			

MSD Sample ID: **18051930-03BMSD** Units: **mg/Kg** Analysis Date: **6/1/2018 02:03 PM**

Client ID: Run ID: **HG1_180601A** SeqNo: **5067324** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1487	0.017	0.1415	0.01827	92.2	75-125	0.1487	0.0387	35	

The following samples were analyzed in this batch:

18051974-01A	18051974-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051974
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119096** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-119096-119096** Units: **mg/Kg** Analysis Date: **6/1/2018 09:18 PM**
Client ID: Run ID: **ICPMS3_180601A** SeqNo: **5069204** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.07935	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-119096-119096** Units: **mg/Kg** Analysis Date: **6/1/2018 09:20 PM**
Client ID: Run ID: **ICPMS3_180601A** SeqNo: **5069205** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5	0.25	5	0	100	80-120	0			
Barium	5.01	0.25	5	0	100	80-120	0			
Beryllium	4.88	0.10	5	0	97.6	80-120	0			
Boron	25.01	1.0	25	0	100	80-120	0			
Cadmium	5.047	0.10	5	0	101	80-120	0			
Lead	5.025	0.25	5	0	101	80-120	0			
Lithium	5.144	0.50	5	0	103	80-120	0			
Molybdenum	5.198	0.25	5	0	104	80-120	0			
Selenium	4.959	0.25	5	0	99.2	80-120	0			

MS Sample ID: **18051774-08AMS** Units: **mg/Kg** Analysis Date: **6/1/2018 09:52 PM**
Client ID: Run ID: **ICPMS3_180601A** SeqNo: **5069223** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	15.67	0.41	8.117	9.414	77.1	75-125	0			
Barium	101	0.41	8.117	92.08	110	75-125	0			O
Beryllium	6.7	0.16	8.117	0.4306	77.2	75-125	0			
Boron	37.08	1.6	40.58	4.571	80.1	75-125	0			
Cadmium	8.374	0.16	8.117	2.159	76.6	75-125	0			
Lithium	13.38	0.81	8.117	4.43	110	75-125	0			
Molybdenum	7.897	0.41	8.117	1.337	80.8	75-125	0			
Selenium	7.254	0.41	8.117	1.148	75.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051974
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119096** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18051774-08AMSD** Units: **mg/Kg** Analysis Date: **6/1/2018 09:54 PM**
Client ID: Run ID: **ICPMS3_180601A** SeqNo: **5069224** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	15.88	0.40	8.078	9.414	80.1	75-125	15.67	1.36	20	
Barium	99.09	0.40	8.078	92.08	86.8	75-125	101	1.93	20	O
Beryllium	6.717	0.16	8.078	0.4306	77.8	75-125	6.7	0.252	20	
Boron	37.45	1.6	40.39	4.571	81.4	75-125	37.08	0.988	20	
Cadmium	8.32	0.16	8.078	2.159	76.3	75-125	8.374	0.647	20	
Lithium	13.27	0.81	8.078	4.43	109	75-125	13.38	0.834	20	
Molybdenum	7.915	0.40	8.078	1.337	81.4	75-125	7.897	0.227	20	
Selenium	7.821	0.40	8.078	1.148	82.6	75-125	7.254	7.53	20	

The following samples were analyzed in this batch: 18051974-01A 18051974-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051974
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119172** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-119172-119172** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180601A** SeqNo: **5067171** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	4.123	10								Jx

MS Sample ID: **18051974-02AMS** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: **4169** Run ID: **GALLERY_180601A** SeqNo: **5067174** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	485.3	9.3	463	12.08	102	75-125	0			x

MSD Sample ID: **18051974-02AMSD** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: **4169** Run ID: **GALLERY_180601A** SeqNo: **5067175** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	532	10	498	12.08	104	75-125	485.3	9.18	20	x

LCS1 Sample ID: **LCS1-119172-119172** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180601A** SeqNo: **5067176** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	102	10	100	0	102	80-120	0			x

LCS2 Sample ID: **LCS2-119172-119172** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180601A** SeqNo: **5067177** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	538.6	10	500	0	108	80-120	0			x

The following samples were analyzed in this batch:

18051974-01A	18051974-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051974
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R237090** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R237090** Units: **% of sample** Analysis Date: **5/31/2018 01:00 PM**
Client ID: Run ID: **MOIST_180531A** SeqNo: **5065316** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R237090** Units: **% of sample** Analysis Date: **5/31/2018 01:00 PM**
Client ID: Run ID: **MOIST_180531A** SeqNo: **5065315** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.99	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **18051974-01A DUP** Units: **% of sample** Analysis Date: **5/31/2018 01:00 PM**
Client ID: **4204** Run ID: **MOIST_180531A** SeqNo: **5065300** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.76	0.050	0	0	0	0-0	15.59	1.08	10	

DUP Sample ID: **18052001-01A DUP** Units: **% of sample** Analysis Date: **5/31/2018 01:00 PM**
Client ID: Run ID: **MOIST_180531A** SeqNo: **5065314** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.21	0.050	0	0	0	0-0	13.91	2.13	10	

The following samples were analyzed in this batch:

18051974-01A	18051974-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 40809

ALS Project Manager: | ALS Work Order #: 1805197

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CAAP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	EES	Bill To Company	HBPW	C	
Send Report To	Blaine Litteral + Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax	blaine.litteral@geosolutions.net	Fax		I	
e-Mail Address	amy.mandrell@geosolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4204	5/30/18	4:20	Soil		1	X										
2	4/09	5/30/18	3:50	Soil		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell — Date: 5/30/18 — Time:

Received by:

Relinquished by: — Date: 5/31/18 — Time: 0827

Received by (Laboratory):

Logged by (Laboratory): DES — Date: 5/31/18 — Time: 0830

Checked by (Laboratory):

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Notes:

Cooler ID	Cooler Temp
SR2	10.6°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **31-May-18 08:27**

Work Order: **18051974** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 31-May-18 (Date) Reviewed by: Bill Carey (eSignature) 31-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	10.6/10.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/31/2018 8:29:31 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:

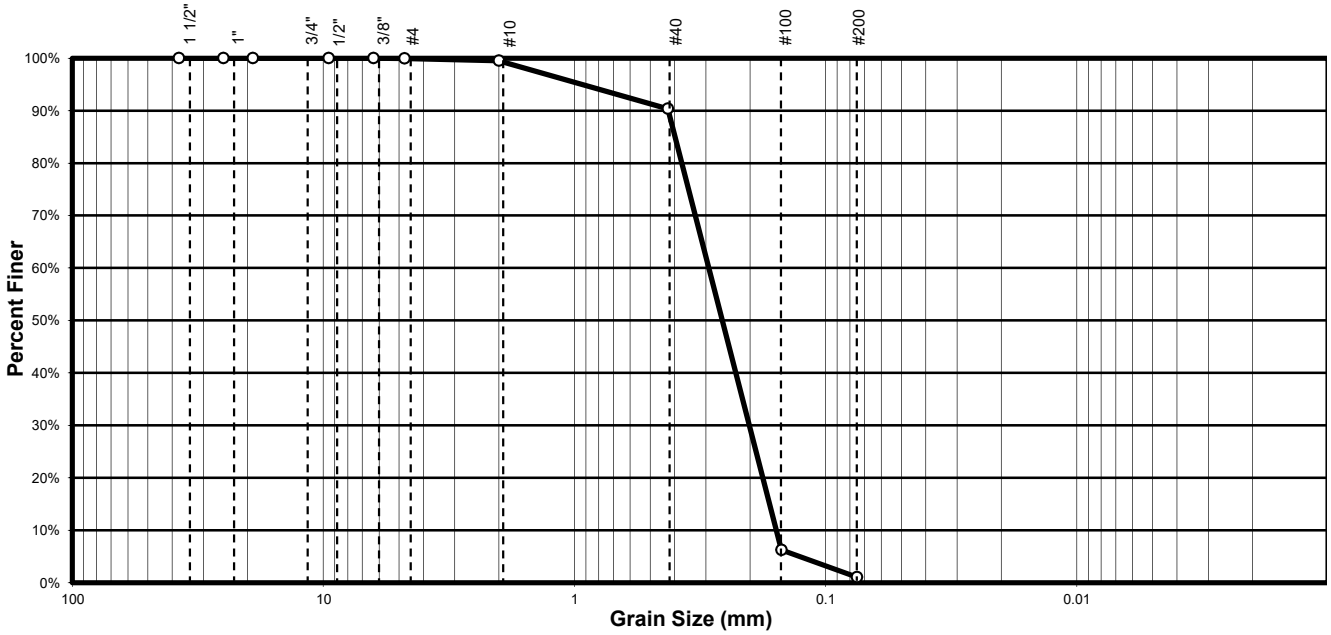
Comments:

CorrectiveAction:

APPENDIX D.1.1

PRELIMINARY FILL TEST RESULTS

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	9.2	89.3	1.1	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	100.0%		
1/4"	100.0%		
#4	99.9%		
#10	99.5%		
#40	90.4%		
#100	6.3%		
#200	1.1%		

Material Description

Brown, mostly fine Sand

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.07 Cc= 3.714

D_{30}= 0.15 Cu= 0.084

D_{60}= 0.26

Classification

Remarks

Sample ID: s-01	Client: Holland BPW
Lab ID:	Project: Coal Yard Closure

Engineering & Environmental Solutions Project Number: 133-17-001

Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B, Holland, Michigan 49424

Memorandum

To	Jane Monroe		
Company	Holland BPW		
From	Kurt Van Appledorn, P.G.	*Project Number*	133-17-001
Date	September 20, 2017		

Re: Fill Sand for James DeYoung Coal Yard

Jane:

The stockpile of sand that is intended to be utilized for the Holland BPW James DeYoung coal yard project was sampled for Michigan 10 metals on September 7, 2017. The sand samples were collected from a sand pit operation located north of Croswell Street and east of 152nd Avenue in Port Sheldon Township. The laboratory results were compared to Part 201 Generic Cleanup Criteria. All metals with detectable levels were found to be below the Statewide Default Background Levels and Residential Drinking Water Protection Criteria. Copies of the laboratory results are attached.

If you have any questions, please call me at 616-566-7542 or email me a kurt.vanappledorn@goeesolutions.net.

Kurtis J Van Appledorn, P.G.
Project Manager

18-Sep-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **Ryan Inc** Work Order: **1709340**

Dear Blaine,

ALS Environmental received 4 samples on 07-Sep-2017 04:07 PM 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 industry accepted practices and Quality Control 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 15.

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

ALS Group, USA

Date: 18-Sep-17

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: **1709340**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1709340-01	S-1	Soil		9/7/2017 15:31	9/7/2017 16:07	☐
1709340-02	S-2	Soil		9/7/2017 15:33	9/7/2017 16:07	☐
1709340-03	S-3	Soil		9/7/2017 15:37	9/7/2017 16:07	☐
1709340-04	S-4	Soil		9/7/2017 15:39	9/7/2017 16:07	☐

ALS Group, USA

Date: 18-Sep-17

Client: Engineering & Environmental Solutions
Project: Ryan Inc
WorkOrder: **1709340**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: 18-Sep-17

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340

Case Narrative

Samples for the above noted Work Order were received on 9/7/2017. 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. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Metals:
No other deviations or anomalies were noted.

Wet Chemistry:
No other deviations or anomalies were noted.

ALS Group, USA

Date: *18-Sep-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340
Sample ID: S-1
Lab ID: 1709340-01
Collection Date: 9/7/2017 03:31 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/13/17 15:45		Analyst: **RSH**
Mercury	ND		0.016	mg/Kg-dry	1	9/14/2017 12:27 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/11/17 11:54		Analyst: **RH**
Arsenic	ND		0.46	mg/Kg-dry	1	9/11/2017 07:32 PM
Barium	**3.7**		**0.46**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
Cadmium	ND		0.93	mg/Kg-dry	1	9/11/2017 07:32 PM
Chromium	**1.7**		**0.46**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
Copper	**0.93**		**0.93**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
Lead	**0.71**		**0.46**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
Selenium	ND		0.93	mg/Kg-dry	1	9/11/2017 07:32 PM
Silver	ND		0.46	mg/Kg-dry	1	9/11/2017 07:32 PM
Zinc	**3.9**		**0.93**	**mg/Kg-dry**	1	9/11/2017 07:32 PM
MOISTURE			**SW3550C**			Analyst: **BTG**
Moisture	**17**		**0.050**	**% of sample**	1	9/13/2017 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *18-Sep-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340
Sample ID: S-2
Lab ID: 1709340-02
Collection Date: 9/7/2017 03:33 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/13/17 15:45		Analyst: **RSH**
Mercury	ND		0.014	mg/Kg-dry	1	9/14/2017 12:30 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/11/17 11:54		Analyst: **RH**
Arsenic	**0.92**		**0.42**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Barium	**4.2**		**0.42**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Cadmium	ND		0.83	mg/Kg-dry	1	9/11/2017 07:38 PM
Chromium	**1.6**		**0.42**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Copper	**1.2**		**0.83**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Lead	**0.83**		**0.42**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
Selenium	ND		0.83	mg/Kg-dry	1	9/11/2017 07:38 PM
Silver	ND		0.42	mg/Kg-dry	1	9/11/2017 07:38 PM
Zinc	**7.2**		**0.83**	**mg/Kg-dry**	1	9/11/2017 07:38 PM
MOISTURE			**SW3550C**			Analyst: **BTG**
Moisture	**6.4**		**0.050**	**% of sample**	1	9/13/2017 03:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *18-Sep-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340
Sample ID: S-3
Lab ID: 1709340-03
Collection Date: 9/7/2017 03:37 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/13/17 15:45		Analyst: **RSH**
Mercury	ND		0.014	mg/Kg-dry	1	9/14/2017 12:32 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/11/17 11:54		Analyst: **RH**
Arsenic	**0.57**		**0.44**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Barium	**4.0**		**0.44**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Cadmium	ND		0.87	mg/Kg-dry	1	9/11/2017 07:44 PM
Chromium	**2.3**		**0.44**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Copper	**2.1**		**0.87**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Lead	**0.95**		**0.44**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
Selenium	ND		0.87	mg/Kg-dry	1	9/11/2017 07:44 PM
Silver	ND		0.44	mg/Kg-dry	1	9/11/2017 07:44 PM
Zinc	**6.1**		**0.87**	**mg/Kg-dry**	1	9/11/2017 07:44 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**5.7**		**0.050**	**% of sample**	1	9/13/2017 06:20 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *18-Sep-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc
Work Order: 1709340
Sample ID: S-4
Lab ID: 1709340-04
Collection Date: 9/7/2017 03:39 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/13/17 15:45		Analyst: **RSH**
Mercury	ND		0.013	mg/Kg-dry	1	9/14/2017 12:35 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/11/17 11:54		Analyst: **RH**
Arsenic	**0.52**		**0.39**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
Barium	**3.6**		**0.39**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
Cadmium	ND		0.79	mg/Kg-dry	1	9/11/2017 08:16 PM
Chromium	**1.8**		**0.39**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
Copper	**0.91**		**0.79**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
Lead	**0.56**		**0.39**	**mg/Kg-dry**	1	9/14/2017 12:01 AM
Selenium	ND		0.79	mg/Kg-dry	1	9/11/2017 08:16 PM
Silver	ND		0.39	mg/Kg-dry	1	9/11/2017 08:16 PM
Zinc	**3.8**		**0.79**	**mg/Kg-dry**	1	9/11/2017 08:16 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**5.0**		**0.050**	**% of sample**	1	9/13/2017 06:20 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

QC BATCH REPORT

Batch ID: **107349** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-107349-107349**			Units: **mg/Kg**			Analysis Date: **9/14/2017 12:22 PM**			
Client ID:	Run ID: **HG1_170914A**			SeqNo: **4638765**			Prep Date: **9/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-107349-107349**			Units: **mg/Kg**			Analysis Date: **9/14/2017 12:25 PM**			
Client ID:	Run ID: **HG1_170914A**			SeqNo: **4638766**			Prep Date: **9/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1783	0.020	0.1665	0	107	80-120	0			

MS	Sample ID: **1709340-04AMS**			Units: **mg/Kg**			Analysis Date: **9/14/2017 12:37 PM**			
Client ID: **S-4**	Run ID: **HG1_170914A**			SeqNo: **4638771**			Prep Date: **9/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1481	0.017	0.1376	-0.0007473	108	75-125	0			

MSD	Sample ID: **1709340-04AMSD**			Units: **mg/Kg**			Analysis Date: **9/14/2017 12:40 PM**			
Client ID: **S-4**	Run ID: **HG1_170914A**			SeqNo: **4638772**			Prep Date: **9/13/2017**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1436	0.016	0.1367	-0.0007473	106	75-125	0.1481	3.04	35	

The following samples were analyzed in this batch:

1709340-01A 1709340-02A 1709340-03A
1709340-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1709340
Project: Ryan Inc

QC BATCH REPORT

Batch ID: **107196** Instrument ID **ICP2** Method: **SW846 6010C**

MBLK Sample ID: **MBLK-107196-107196** Units: **mg/Kg** Analysis Date: **9/11/2017 04:12 PM**
Client ID: Run ID: **ICP2_170911A** SeqNo: **4633277** Prep Date: **9/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	0.03881	0.50								J
Chromium	0.03656	0.25								J
Copper	ND	0.50								
Lead	ND	0.25								
Selenium	ND	0.50								
Silver	ND	0.25								
Zinc	ND	0.50								

LCS Sample ID: **LCS-107196-107196** Units: **mg/Kg** Analysis Date: **9/11/2017 04:18 PM**
Client ID: Run ID: **ICP2_170911A** SeqNo: **4633278** Prep Date: **9/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.878	0.25	5	0	97.6	80-120	0			
Barium	5.004	0.25	5	0	100	80-120	0			
Cadmium	5.182	0.50	5	0	104	80-120	0			
Chromium	5.403	0.25	5	0	108	80-120	0			
Copper	4.986	0.50	5	0	99.7	80-120	0			
Lead	5.481	0.25	5	0	110	80-120	0			
Selenium	4.476	0.50	5	0	89.5	80-120	0			
Silver	4.973	0.25	5	0	99.5	80-120	0			
Zinc	5.134	0.50	5	0	103	80-120	0			

MS Sample ID: **1709279-01A MS** Units: **mg/Kg** Analysis Date: **9/11/2017 05:59 PM**
Client ID: Run ID: **ICP2_170911A** SeqNo: **4634382** Prep Date: **9/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.439	0.38	7.599	0.9889	98	75-125	0			
Barium	28.83	0.38	7.599	16.86	158	75-125	0			S
Cadmium	7.899	0.76	7.599	0.1561	102	75-125	0			
Chromium	11.38	0.38	7.599	2.338	119	75-125	0			
Copper	13.61	0.76	7.599	6.03	99.7	75-125	0			
Lead	11.79	0.38	7.599	5.349	84.8	75-125	0			
Selenium	7.939	0.76	7.599	1.274	87.7	75-125	0			
Silver	7.328	0.38	7.599	-0.02793	96.8	75-125	0			
Zinc	22.59	0.76	7.599	9.04	178	75-125	0			S

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1709340
Project: Ryan Inc

QC BATCH REPORT

Batch ID: **107196** Instrument ID **ICP2** Method: **SW846 6010C**

MSD Sample ID: **1709279-01A MSD** Units: **mg/Kg** Analysis Date: **9/11/2017 06:05 PM**
Client ID: Run ID: **ICP2_170911A** SeqNo: **4634383** Prep Date: **9/11/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.904	0.38	7.599	0.9889	104	75-125	8.439	5.36	20	
Barium	29.87	0.38	7.599	16.86	171	75-125	28.83	3.53	20	S
Cadmium	8.432	0.76	7.599	0.1561	109	75-125	7.899	6.52	20	
Chromium	11.51	0.38	7.599	2.338	121	75-125	11.38	1.14	20	
Copper	11.58	0.76	7.599	6.03	73	75-125	13.61	16.1	20	S
Lead	11.95	0.38	7.599	5.349	86.9	75-125	11.79	1.36	20	
Selenium	8.662	0.76	7.599	1.274	97.2	75-125	7.939	8.71	20	
Silver	7.767	0.38	7.599	-0.02793	103	75-125	7.328	5.82	20	
Zinc	26.6	0.76	7.599	9.04	231	75-125	22.59	16.3	20	S

The following samples were analyzed in this batch: 1709340-01A 1709340-02A 1709340-03A 1709340-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1709340
Project: Ryan Inc

QC BATCH REPORT

Batch ID: **R219993** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R219993** Units: **% of sample** Analysis Date: **9/13/2017 03:00 PM**
Client ID: Run ID: **MOIST_170913C** SeqNo: **4638240** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R219993** Units: **% of sample** Analysis Date: **9/13/2017 03:00 PM**
Client ID: Run ID: **MOIST_170913C** SeqNo: **4638239** 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: **1709095-03A DUP** Units: **% of sample** Analysis Date: **9/13/2017 03:00 PM**
Client ID: Run ID: **MOIST_170913C** SeqNo: **4638234** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	25.02	0.050	0	0	0	0-0	23.05	8.2	5	R

DUP Sample ID: **1709325-02A DUP** Units: **% of sample** Analysis Date: **9/13/2017 03:00 PM**
Client ID: Run ID: **MOIST_170913C** SeqNo: **4638236** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	22.11	0.050	0	0	0	0-0	22.9	3.51	5	

The following samples were analyzed in this batch: 1709340-01A 1709340-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1709340
Project: Ryan Inc

QC BATCH REPORT

Batch ID: **R219996** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R219996** Units: **% of sample** Analysis Date: **9/13/2017 06:20 PM**
Client ID: Run ID: **MOIST_170913D** SeqNo: **4638312** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R219996** Units: **% of sample** Analysis Date: **9/13/2017 06:20 PM**
Client ID: Run ID: **MOIST_170913D** SeqNo: **4638311** 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: **1709371-03A DUP** Units: **% of sample** Analysis Date: **9/13/2017 06:20 PM**
Client ID: Run ID: **MOIST_170913D** SeqNo: **4638292** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.35	0.050	0	0	0	0-0	18.58	6.85	5	R

DUP Sample ID: **1709371-07A DUP** Units: **% of sample** Analysis Date: **9/13/2017 06:20 PM**
Client ID: Run ID: **MOIST_170913D** SeqNo: **4638297** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	30.94	0.050	0	0	0	0-0	31.16	0.709	5	

The following samples were analyzed in this batch: 1709340-03A 1709340-04A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
South Charleston, WV +1 304 356 3168
York, PA +1 717 505 5280

Chain of Custody Form

ALS Environmental

Page ____ of ____

COC ID: 38942

ALS Project Manager: | ALS Work Order #: 1709340

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Ryan Inc	A	MI 10 Metals
Work Order		Project Number	032-17-001	B	
Company Name	Engineering & Environmental Solutions	Bill To Company	Engineering & Environmental Solutions	C	
Send Report To	Blaine Litteral	Invoice Attn		D	
Address	400 136th Ave Bldg 100, Suite B	Address	400 136th Ave Bldg 100, Suite B	E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip	Holland, MI 49424	G	
Phone	(616) 931-3967	Phone	(616) 931-3967	H	
Fax	(616) 931-3970	Fax	(616) 931-3970	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	S-1	9/7	3:31	Sand		1	X										
2	S-2	9/7	3:33	Sand		1	X										
3	S-3	9/7	3:37	Sand		1	X										
4	S-4	9/7	3:39	Sand		1	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Mitchell Stark

Shipment Method:

Turnaround Time in Business Days (BD): ☒ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other

Results Due Date:

Relinquished by:	Date: 9/7	Time: 4:07	Received by:	Notes:	
Relinquished by:	Date:	Time:	Received by (Laboratory): 4:07pm 9-7-17	Cooler ID: SR2	Cooler Temp: 5.6°C
Logged by (Laboratory): DES	Date: 9/7/17	Time: 1620	Checked by (Laboratory):		

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **07-Sep-17 16:07**

Work Order: **1709340** Received by: **SA**

Checklist completed by Diane Shaw (eSignature) 07-Sep-17 (Date) Reviewed by: Bill Carey (eSignature) 08-Sep-17 (Date)

Matrices: Soil
Carrier name: Client

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):	5.6/5.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	9/7/2017 4:23:07 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:

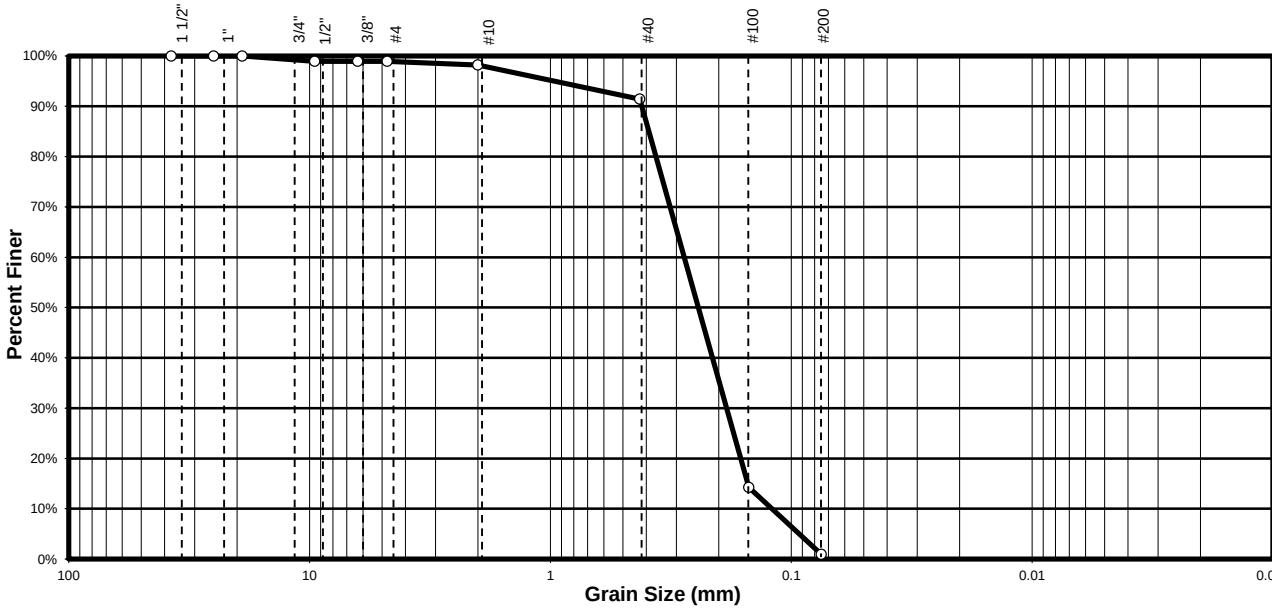
Comments:

CorrectiveAction:

APPENDIX D.1.2

FINAL CONFORMANCE FILL TEST RESULTS

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	6.8	90.5	0.9	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	98.9%		
1/4"	98.9%		
#4	98.9%		
#10	98.2%		
#40	91.4%		
#100	14.3%		
#200	0.9%		

Material Description

Brown medium to fine SAND

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.13 Cc= 2.154

D_{30}= 0.18 Cu= 0.07

D_{60}= 0.28

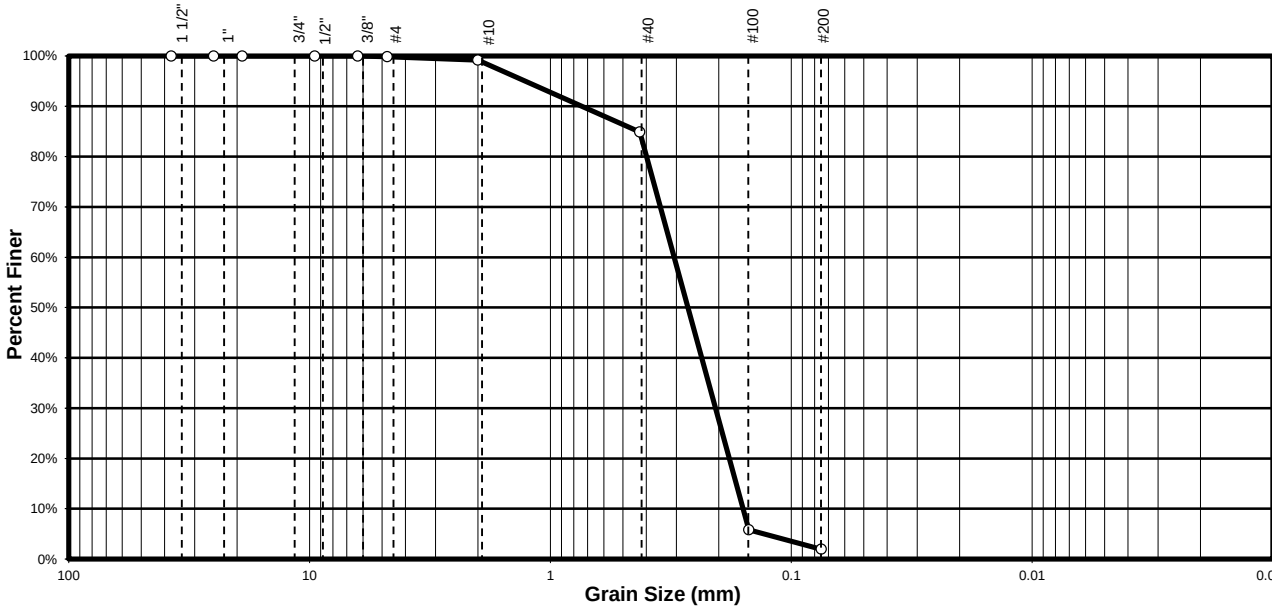
Classification

SP, Poorly Graded Sand

Remarks

Sample ID:	Leachate Sand	Client:	Holland BPW
Lab ID:	LS-13	Project:	James DeYoung CYAP
	Engineering & Environmental Solutions, LLC	Project Number:	133-17-001

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	14.3	83.0	1.8	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	100.0%		
1/4"	100.0%		
#4	99.8%		
#10	99.2%		
#40	84.9%		
#100	5.8%		
#200	1.9%		

Material Description

Brown medium to fine SAND

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.16 Cc= 1.875

D_{30}= 0.2 Cu= 0.075

D_{60}= 0.3

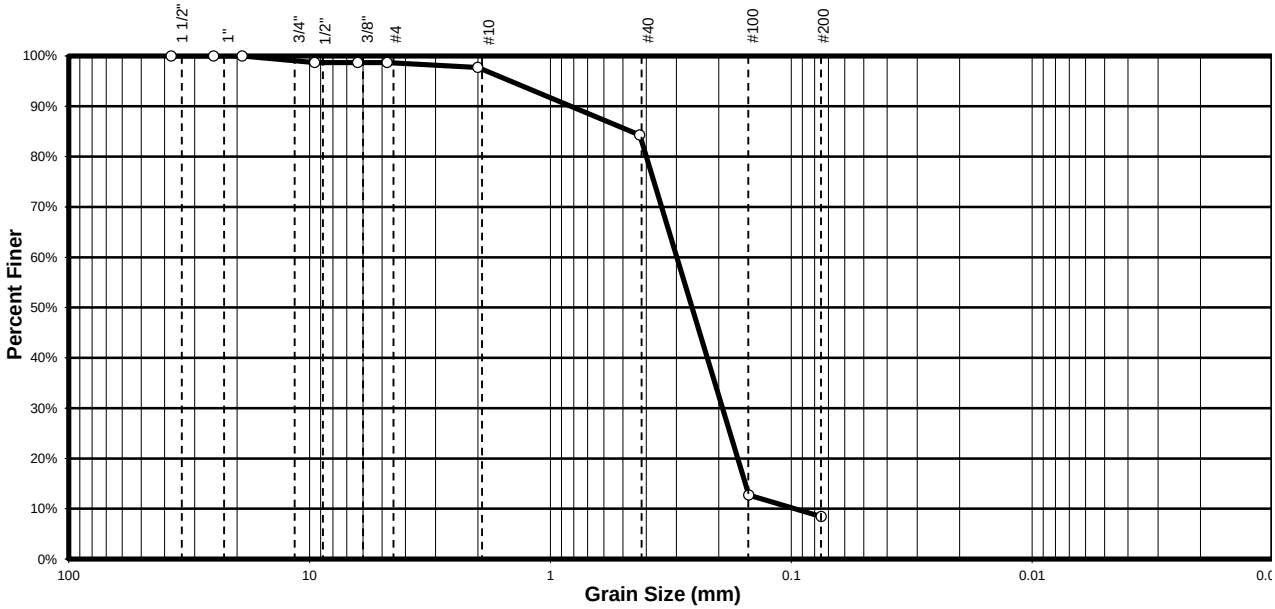
Classification

SP, Poorly Graded Sand

Remarks

Sample ID:	Leachate Sand	Client:	Holland BPW
Lab ID:	LS-13	Project:	James DeYoung CYAP
	Engineering & Environmental Solutions, LLC	Project Number:	133-17-001

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	13.8	77.9	5.9	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	98.7%		
1/4"	98.7%		
#4	98.7%		
#10	97.7%		
#40	84.3%		
#100	12.7%		
#200	8.4%		

Material Description

Brown medium to fine SAND

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.1 Cc= 3

D_{30}= 0.18 Cu= 0.097

D_{60}= 0.3

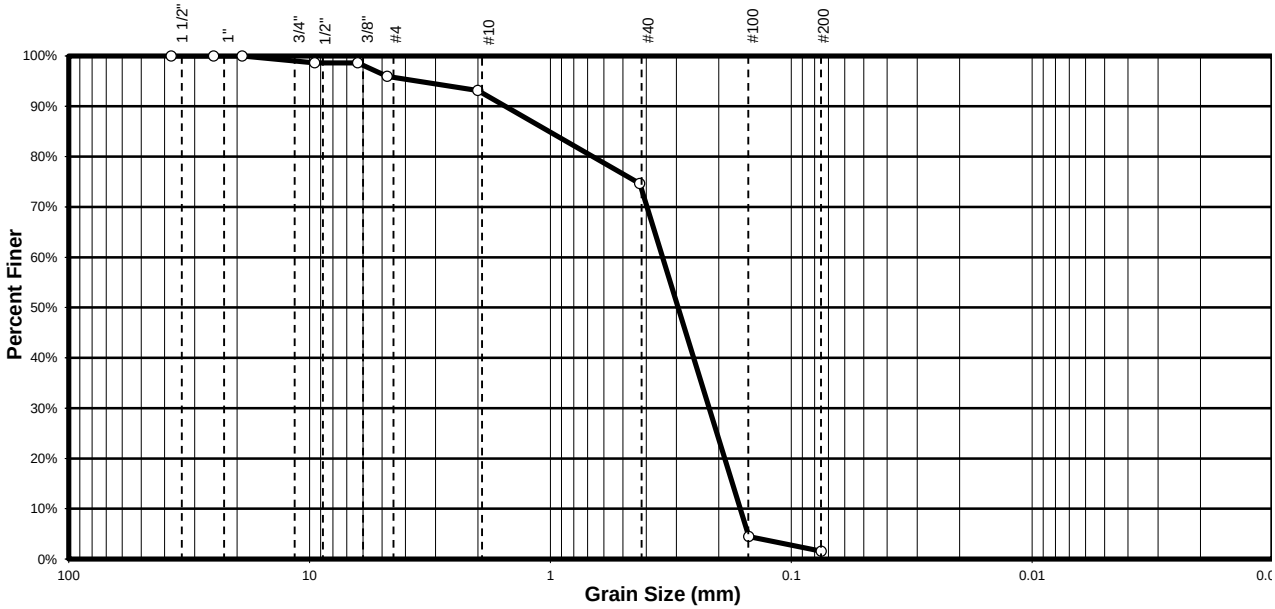
Classification

SP, Poorly Graded Sand

Remarks

Sample ID:	Leachate Sand	Client:	Holland BPW
Lab ID:	LS-13	Project:	James DeYoung CYAP
	Engineering & Environmental Solutions, LLC	Project Number:	133-17-001

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.8	18.5	73.1	1.5	0.0

SIEVE SIZE	PERCENT FINER	SPEC. PERCENT	PASS? (X=NO)
1 1/2"	100.0%		
1"	100.0%		
3/4"	100.0%		
1/2"	100.0%		
3/8"	98.6%		
1/4"	98.6%		
#4	95.9%		
#10	93.1%		
#40	74.6%		
#100	4.5%		
#200	1.6%		

Material Description

Brown medium to fine SAND

Atterberg Limits

PL= NA LL= NA PI= NA

Coefficients

D_{10}= 0.17 Cc= 1.941

D_{30}= 0.22 Cu= 0.094

D_{60}= 0.33

Classification

SP, Poorly Graded Sand

Remarks

Sample ID:	Leachate Sand	Client:	Holland BPW
Lab ID:	LS-13	Project:	James DeYoung CYAP
	Engineering & Environmental Solutions, LLC	Project Number:	133-17-001

DRIESENGA & ASSOCIATES, INC.
Engineering · Surveying · Testing

12330 James Street, Suite H80
Holland, Michigan 49424
Ph. (616) 396-0255 • Fax (616) 396-0100
www.driesenga.com

Maximum Dry Density/Optimum Moisture Determination
ASTM Method D1557

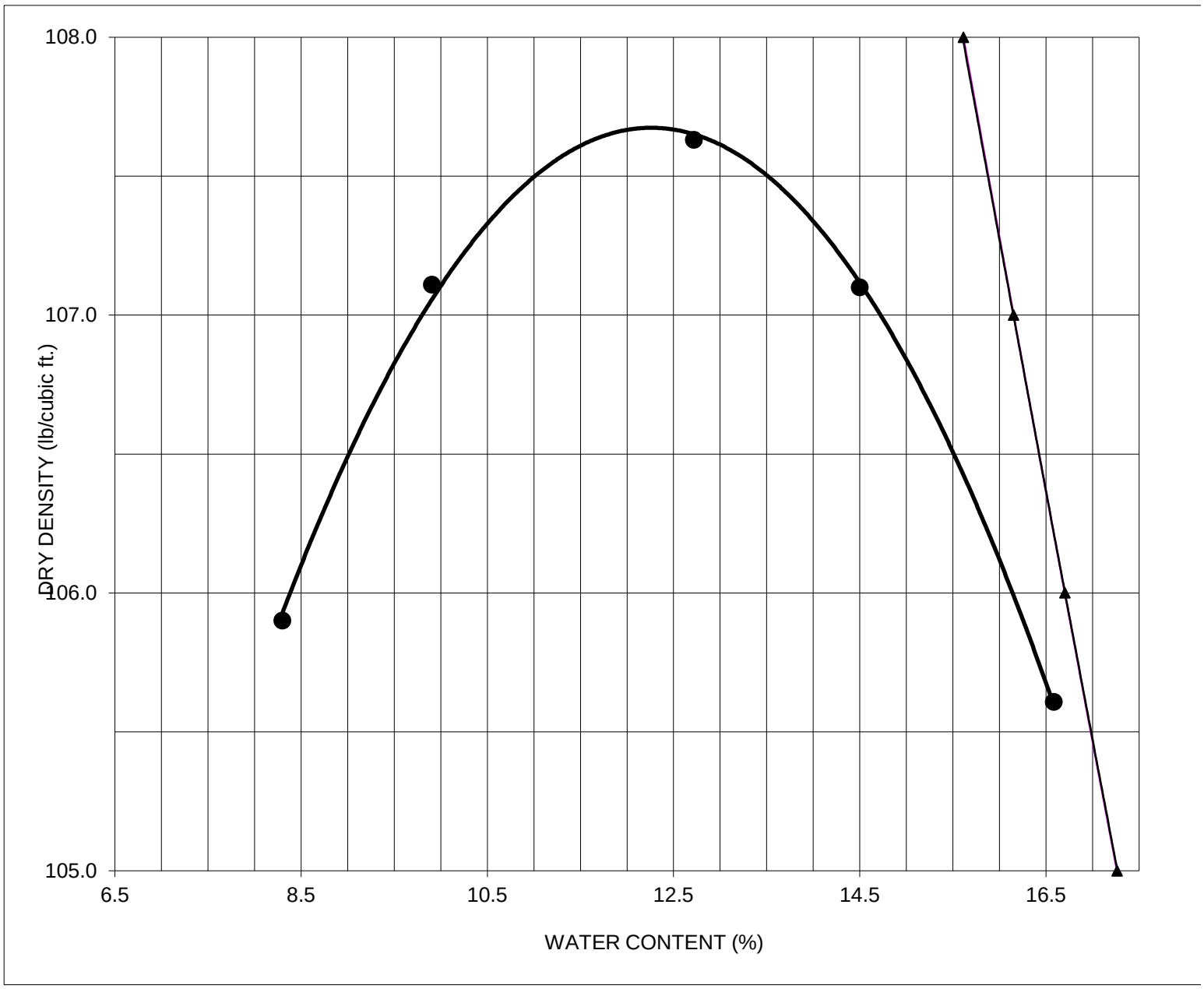
Project Name: Holland BPW - 133-17-001

Date of Test: 4/4/2018 Project Number: 1710797.4A

Sample Description: Brown Fine to Medium Sand, Trace Silt

Sampled By: Client Tested in Lab By: Jake Stocking

Specific Gravity of Soil (Gs): 2.37 (assumed)



n Laboratory Test Data t 100% Saturation Line

Maximum Dry Density: **107.5 PCF** Optimum Moisture Content: **12.5%**

ASTM Method: Procedure A, Moist Preparation Method, Manual Rammer

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Maximum Dry Density/Optimum Moisture Determination
ASTM Method D1557

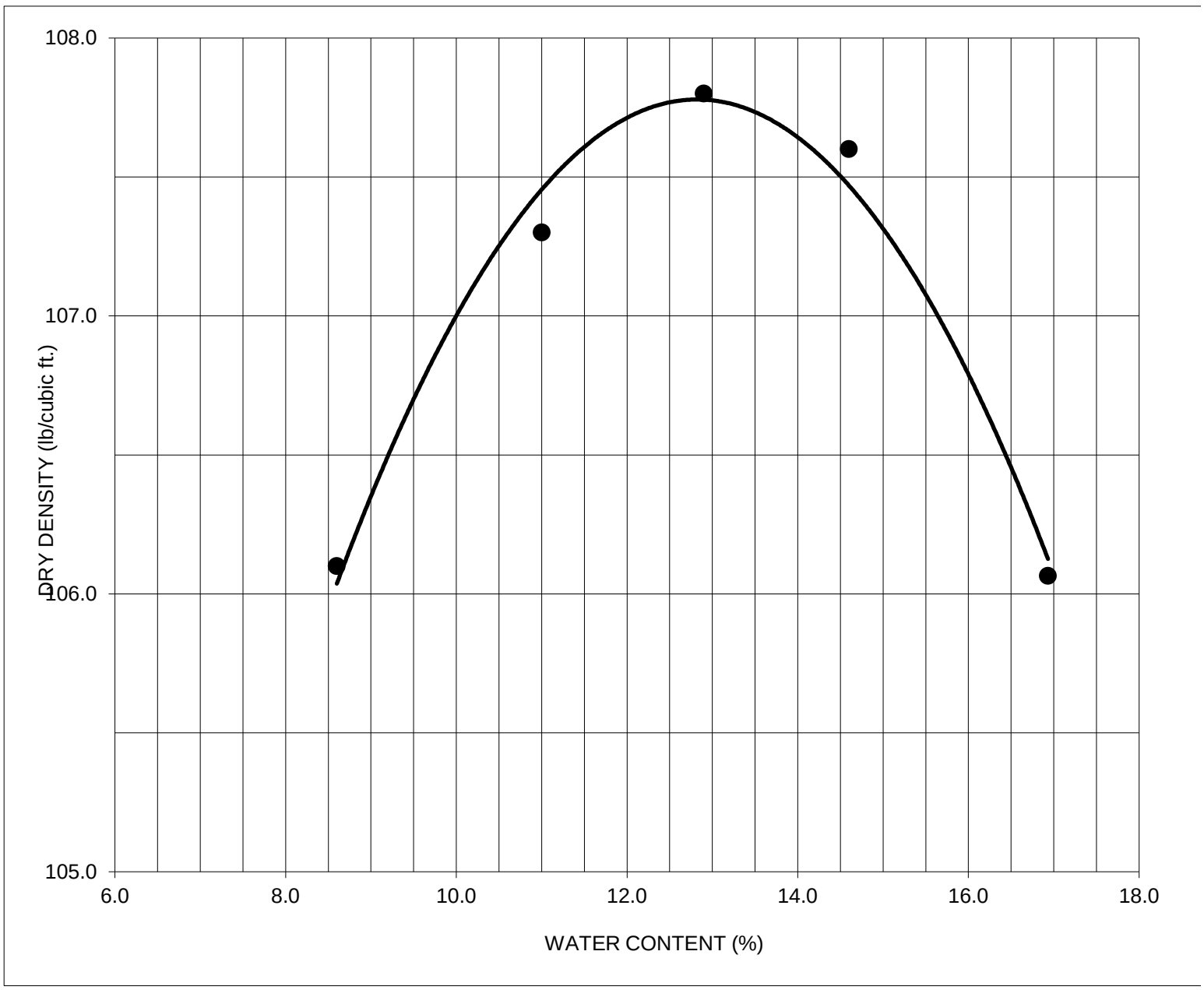
Project Name: Holland BPW - 133-17-001

Date of Test: 5/9/2018 Project Number: 1710797.4A

Sample Description: Light Brown Fine to Medium Sand, Trace Silt - Sample #7

Sampled By: Client Tested in Lab By: Josh Hunsaker

Specific Gravity of Soil (Gs): 2.55 (assumed)



n Laboratory Test Data t 100% Saturation Line

Maximum Dry Density: **108.0 PCF** Optimum Moisture Content: **13.0%**

ASTM Method: Procedure A, Moist Preparation Method, Manual Rammer

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Holland, Michigan 49424
Ph. (616) 396-0255 • Fax (616) 396-0100
www.driesenga.com

Maximum Dry Density/Optimum Moisture Determination
ASTM Method D1557

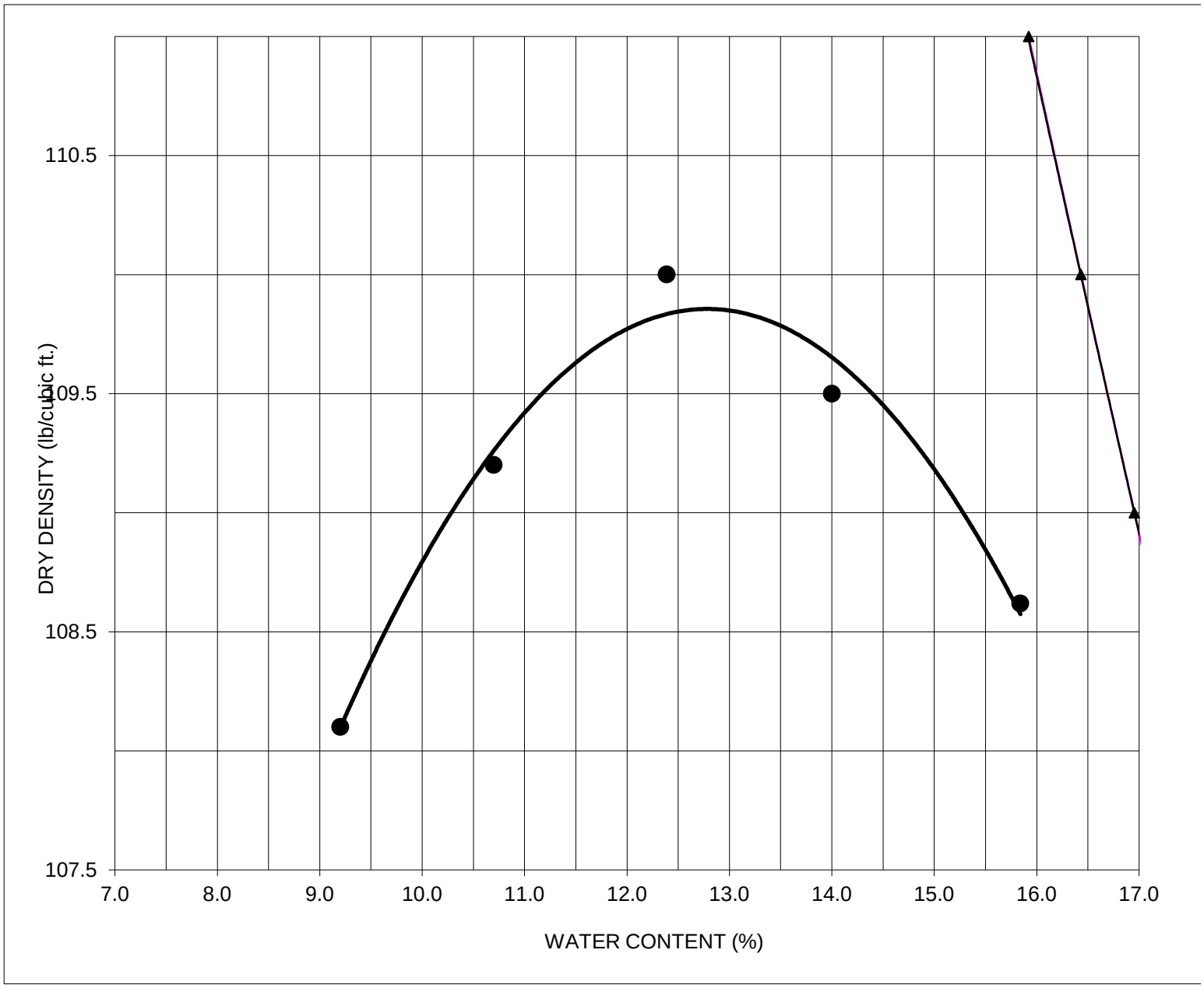
Project Name: Holland BPW - 133-17-001

Date of Test: 5/9/2018 Project Number: 1710797.4A

Sample Description: Brown Fine to Medium Sand, Trace Silt - Sample #8

Sampled By: Client Tested in Lab By: Josh Hunsaker

Specific Gravity of Soil (Gs): 2.60 (assumed)



n Laboratory Test Data t 100% Saturation Line

Maximum Dry Density: **110.0 PCF** Optimum Moisture Content: **13.0%**

ASTM Method: Procedure A, Moist Preparation Method, Manual Rammer

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Holland, Michigan 49424
Ph. (616) 396-0255 • Fax (616) 396-0100
www.driesenga.com

Maximum Dry Density/Optimum Moisture Determination
ASTM Method D1557

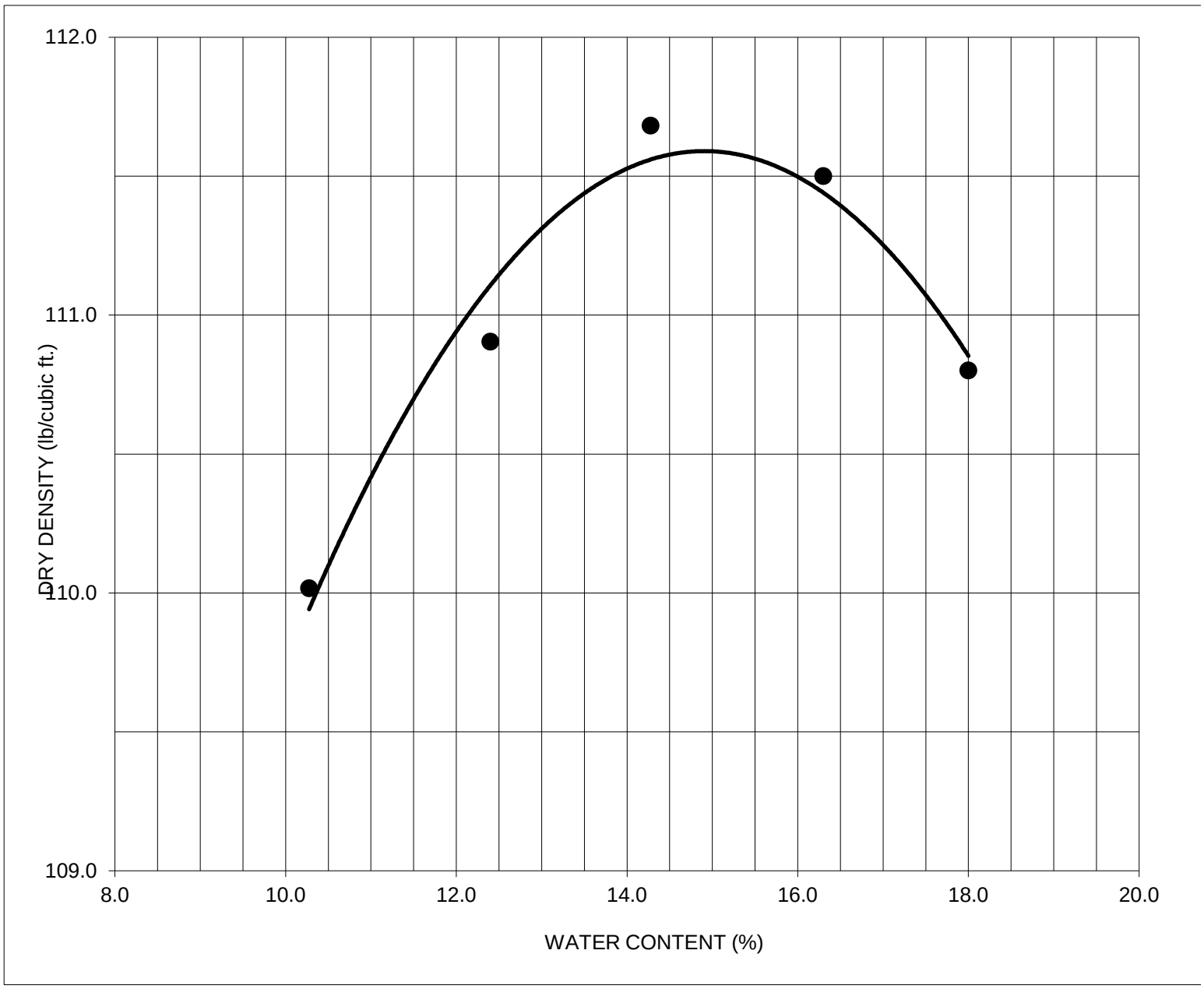
Project Name: Holland BPW - 133-17-001

Date of Test: 5/10/2018 Project Number: 1710797.4A

Sample Description: Light Brown Fine to Coarse Sand, Trace Gravel, Trace Silt - Sample #9

Sampled By: Client Tested in Lab By: Josh Hunsaker

Specific Gravity of Soil (Gs): 2.62 (assumed)



n Laboratory Test Data t 100% Saturation Line

Maximum Dry Density: **111.0 PCF** Optimum Moisture Content: **15.0%**

ASTM Method: Procedure A, Moist Preparation Method, Manual Rammer

APPENDIX D.1.3

FIELD DENSITY TESTING RESULTS

Engineering & Environmental Solutions, LLC

www.goEEsolutions.net

Moisture and Density Log

Date: 5-3-18

Project:	JDY Power Plant CCR Impoundment System Closure	Project No:	133-17-001
Field Tech:	Amy Mandrell		

Weather: Cloudy
Temperature: 60
Precipitation: Rain

Standard Counts

	Density	Moisture
Reference	1590 to 1623	621
Daily	1603	607

Area Tested:	Ponds 2 and 3
Soil Type:	Sand
Gauge No:	3411

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	12"	1, Pond 3	1	127.3	111.2	16.1	107.5	12.5	14.5	103.4		
2	12"	2, Pond 3	1	120.9	103.6	17.2	107.5	12.5	16.6	96.3		
3	12"	3, Pond 3	1	109.1	98.8	10.2	107.5	12.5	10.4	91.9		
4	12"	4, Pond 3	1	114.2	104.8	9.3	107.5	12.5	8.9	92.5		
5	12"	5, Pond 2	1	105.5	100.5	4.9	107.5	12.5	4.7	93.5		
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Notes:

Amy Mandrell

Field Tech _____

Engineering & Environmental Solutions, LLC
www.goEEsolutions.net

Moisture and Density Log

Date: 5-4-18

Weather: Windy	
Temperature: 60	
Precipitation: Rain	

Project: JDY Power Plant CCR Impoundment System Closure Project No: 133-17-001
Field Tech: Amy Mandrell

Standard Counts	Density	Moisture
Reference	1706	652
Daily	1693	644

Area Tested: Ponds and CCR Area
Soil Type: Sand & Topsoil
Gauge No: 3440

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	12"	1, Pond 3	2	119.8	99.7	20.1	107.5	12.5	20.2	92.7		
2	12"	2, Pond 3	2	114.8	108.4	6.4	107.5	12.5	5.9	100.9		
3	12"	3, Pond 3	2	113.7	107.5	6.2	107.5	12.5	5.8	100.0		
4	12"	4, Pond 3	2	113.2	106.2	7	107.5	12.5	6.6	98.8		
5	12"	5, Pond 2	1	106.9	101.1	5.8	107.5	12.5	5.8	94.0		
6	12"	6, Pond 1	1	101.6	96.6	5	107.5	12.5	5.1	89.9		
7	12"	7, Pond 1	1	109.7	104.1	5.6	107.5	12.5	5.4	96.8		
8	12"	8	1	122.9	102.7	20.2	107.5	12.5	19.7	95.5		
9	6"	9	1	113.3	97.1	16.2	107.5	12.5	16.7	90.3		
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Notes:

Amy Mandrell
Field Tech _____

Engineering & Environmental Solutions, LLC
www.goEEsolutions.net

Moisture and Density Log

Date: 5-7-18

Weather: Clear	
Temperature: 65	
Precipitation: None	

Project: JDY Power Plant CCR Impoundment System Closure Project No: 133-17-001
Field Tech: Amy Mandrell

Standard Counts

	Density	Moisture
Reference	1706	652
Daily	1689	645

Area Tested: Ponds 1, 2 & CCR Area
Soil Type: Sand
Gauge No: 3440

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	12"	1, Pond 1	2	107.1	102.8	4.3	107.5	12.5	4.2	95.6		
2	12"	2, Pond 1	2	107.7	103.2	4.5	107.5	12.5	4.3	96.0		
3	12"	3, Pond 2	2	108.2	104.9	3.3	107.5	12.5	3.2	97.6		
4	12"	4, Pond 2	2	111	106.7	4.4	107.5	12.5	4.1	99.2		
5	12"	5	1	104.7	101.2	3.5	107.5	12.5	3.5	94.1		
6	12"	6	1	109.7	105.1	4.6	107.5	12.5	4.4	97.8		
7	12"	7	1	120.4	113.8	6.6	107.5	12.5	5.8	105.9		
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Notes:

Amy Mandrell
Field Tech _____

Engineering & Environmental Solutions, LLC

www.goEEsolutions.net

Moisture and Density Log

Date: 5-8-18

Project: JDY Power Plant CCR Impoundment System Closure Project No: 133-17-001

Field Tech: Amy Mandrell

Weather: Clear
Temperature: 60
Precipitation: None

Standard Counts	Density	Moisture
Reference	1706	652
Daily	1702	649

Area Tested: Pond 3

Soil Type: Sand

Gauge No: 3440

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	12"	1, Pond 3	3	122.6	105	17.6	107.5	12.5	16.8	97.7		
2	12"	2, Pond 3	3	123.6	107.5	16.1	107.5	12.5	15.0	100.0		
3	12"	3, Pond 3	3	121.3	110.8	10.4	107.5	12.5	9.4	103.1		
4	12"	4, Pond 3	3	122.6	111.2	11.4	107.5	12.5	10.2	103.5		
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Notes:

Amy Mandrell

Field Tech _____

Engineering & Environmental Solutions, LLC
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Moisture and Density Log

Date: 5-9-18

Weather: Clear	
Temperature: 63	
Precipitation: None	

Project: JDY Power Plant CCR Impoundment System Closure Project No: 133-17-001
Field Tech: Amy Mandrell

Standard Counts

	Density	Moisture
Reference	1608	627
Daily	1588	549

Area Tested: Ponds 1 & 3
Soil Type: Sand
Gauge No: 3411

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	12"	1, Pond 3	4	104.8	100.7	4	110	12.5	4.0	91.5		
2	12"	2, Pond 3	4	109.5	104.9	4.6	110	12.5	4.4	95.4		
3	12"	3, Pond 1	3	106.9	102.6	4.5	110	12.5	4.1	93.3		
4	12"	4, Pond 1	3	103.8	99.9	3.8	110	12.5	3.8	90.8		
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Notes:

Amy Mandrell
Field Tech _____

Engineering & Environmental Solutions, LLC
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Moisture and Density Log

Date: 5-10-18

Weather:	Cloudy
Temperature:	58
Precipitation:	None

Project: JDY Power Plant CCR Impoundment System Closure Project No: 133-17-001
Field Tech: Amy Mandrell

Standard Counts

	Density	Moisture
Reference	1608	627
Daily	1629	551

Area Tested: Ponds 2 & 3
Soil Type: Sand
Gauge No: 3411

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	12"	1, Pond 3	4	113.4	106.3	7	111	12.5	6.6	95.8		
2	12"	2, Pond 3	4	111.2	104.5	6.7	111	12.5	6.4	94.1		
3	12"	3, Pond 3	4	115.6	107.7	7.9	111	12.5	7.3	97.0		
4	12"	4, Pond 2	3	115.7	108.5	7.1	111	12.5	6.6	97.7		
5	12"	5, Pond 2	3	111.5	103.1	8.3	111		8.1	92.9		
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Notes:

Amy Mandrell
Field Tech _____

Engineering & Environmental Solutions, LLC
www.goEEsolutions.net

Moisture and Density Log

Date: 6/1/2018

Project: JDY Power Plant CCR Impoundment System Closure Project No: 133-17-001
Field Tech: Amy Mandrell

Weather: Clear
Temperature: 94
Precipitation: None

Standard Counts

	Density	Moisture
Reference	1608	627
Daily	1605	601

Area Tested: CCR Area
Soil Type: Sand
Gauge No: 3411

Test No.	Probe Depth	Test Location	Lift Number	Wet Density (pcf) [A]	Dry Density (pcf) [B]	Moisture (pcf)	Max Dry Density (pcf) [C]	Optimum Moisture (%)	Moisture Content (%) [(A/B-1)*100]	Compaction (%) [(B/C)*100]	Reference Sample No.	Comments
1	6"	1	1	124.4	107.5	16.8	111	13%	15.6	96.8		
2	6"	2	1	124.4	108.4	15.9	111	13%	14.7	97.7		
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Notes:

Amy Mandrell
Field Tech _____

APPENDIX D.2

TOPSOIL TEST RESULTS

Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B, Holland, Michigan 49424

Memorandum

To Jane Monroe

Company Holland BPW

From Blaine Litteral, P.E. *Project Number* 133-17-001

Date October 25, 2017

Re: Top Soil for James DeYoung Coal Yard

Jane:

Two stockpiles of top soil that are proposed to be utilized for the Holland BPW James DeYoung coal yard project were sampled for Michigan 10 metals, pH, and organic matter on September 18, 2017. The samples were collected and analyzed on behalf of Ryan Incorporated and the laboratory results compared to Part 201 Generic Cleanup Criteria to obtain approval for use at the site. Copies of the laboratory results are attached.

Top soil samples TS-1 through TS-5 were collected from the sand mining operation located on Perry Street approximately a quarter mile east of 40th Avenue, in southeastern Ottawa County, Michigan. Samples TS-1 through TS-4 were found to be below the Statewide Default Background Levels Criteria with the exception of Selenium. Selenium was below the applicable GSI criteria for the site. The pH and percent organic matter for sample TS-5 met the requirements in Section 02925 of the Construction Documents. Therefore topsoil material from the Perry Street stockpiles are approved for use at the site.

Top soil samples TS-6 through TS-10 were collected from Brewer's Ready Mix Plant at 3246 80th Avenue in Zeeland, MI. The laboratory results were compared to Part 201 Generic Cleanup Criteria. Samples TS-6 through TS-9 were not found to be below the Statewide Default Background Levels Criteria. Sample TS-10 did not meet the pH requirement in Section 02925 of the Construction Documents. Therefore the material from the 80th Avenue stockpiles is not to be used in the constructions.

If you have any questions, please call me at 616-994-6541 or email me a blaine.litteral@goeesolutions.net.

Blaine A. Litteral, P.E.
Certifying Engineer

ALS Environmental

24-Oct-2017

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **Ryan Inc HBPW**

Work Order: **1709984**

Dear Blaine,

Revision: **1**

ALS Environmental received 10 samples on 18-Sep-2017 03:30 PM 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 industry accepted practices and Quality Control 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 25.

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

Report of Laboratory Analysis

ALS Group, USA

Date: 24-Oct-17

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1709984-01	TS-1	Soil		9/18/2017 02:05	9/18/2017 15:30	☐
1709984-02	TS-2	Soil		9/18/2017 02:06	9/18/2017 15:30	☐
1709984-03	TS-3	Soil		9/18/2017 02:06	9/18/2017 15:30	☐
1709984-04	TS-4	Soil		9/18/2017 02:07	9/18/2017 15:30	☐
1709984-05	TS-5	Soil		9/18/2017 02:08	9/18/2017 15:30	☐
1709984-06	TS-6	Soil		9/18/2017 02:27	9/18/2017 15:30	☐
1709984-07	TS-7	Soil		9/18/2017 02:28	9/18/2017 15:30	☐
1709984-08	TS-8	Soil		9/18/2017 02:30	9/18/2017 15:30	☐
1709984-09	TS-9	Soil		9/18/2017 02:31	9/18/2017 15:30	☐
1709984-10	TS-10	Soil		9/18/2017 02:32	9/18/2017 15:30	☐

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
WorkOrder: 1709984

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
%	Percent
% of sample	Percent of Sample
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
s.u.	Standard Units

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984
Sample ID: TS-1
Lab ID: 1709984-01
Collection Date: 9/18/2017 02:05 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.044**		**0.015**	**mg/Kg-dry**	1	9/28/2017 05:00 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/22/17 14:57		Analyst: **HBA**
Arsenic	**5.1**		**0.42**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Barium	**43**		**0.42**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Cadmium	ND		0.85	mg/Kg-dry	1	9/28/2017 12:49 AM
Chromium	**9.3**		**0.42**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Copper	**13**		**0.85**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Lead	**18**		**0.42**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Selenium	**1.7**		**0.85**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
Silver	ND		0.42	mg/Kg-dry	1	9/28/2017 12:49 AM
Zinc	**40**		**0.85**	**mg/Kg-dry**	1	9/28/2017 12:49 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**11**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW **Work Order:** 1709984
Sample ID: TS-2 **Lab ID:** 1709984-02
Collection Date: 9/18/2017 02:06 AM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.042**		**0.013**	**mg/Kg-dry**	1	9/28/2017 05:03 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/22/17 14:57		Analyst: **HBA**
Arsenic	**4.8**		**0.36**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Barium	**40**		**0.36**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Cadmium	ND		0.72	mg/Kg-dry	1	9/28/2017 12:55 AM
Chromium	**9.0**		**0.36**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Copper	**12**		**0.72**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Lead	**17**		**0.36**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Selenium	**1.6**		**0.72**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
Silver	ND		0.36	mg/Kg-dry	1	9/28/2017 12:55 AM
Zinc	**37**		**0.72**	**mg/Kg-dry**	1	9/28/2017 12:55 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**8.1**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-3
Collection Date: 9/18/2017 02:06 AM

Work Order: 1709984
Lab ID: 1709984-03
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.033**		**0.014**	**mg/Kg-dry**	1	9/28/2017 05:06 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/22/17 14:57		Analyst: **HBA**
Arsenic	**4.3**		**0.44**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Barium	**41**		**0.44**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Cadmium	ND		0.88	mg/Kg-dry	1	9/28/2017 01:01 AM
Chromium	**9.1**		**0.44**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Copper	**13**		**0.88**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Lead	**17**		**0.44**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Selenium	**1.8**		**0.88**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
Silver	ND		0.44	mg/Kg-dry	1	9/28/2017 01:01 AM
Zinc	**36**		**0.88**	**mg/Kg-dry**	1	9/28/2017 01:01 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3005A 10/20/17 13:22		Analyst: **JF**
Selenium	ND		0.0050	mg/L	1	10/20/2017 06:21 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**11**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984
Sample ID: TS-4
Lab ID: 1709984-04
Collection Date: 9/18/2017 02:07 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.040**		**0.015**	**mg/Kg-dry**	1	9/28/2017 05:08 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**4.6**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Barium	**40**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Cadmium	ND		0.77	mg/Kg-dry	1	9/28/2017 02:24 AM
Chromium	**8.9**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Copper	**12**		**0.77**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Lead	**17**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Selenium	**1.7**		**0.77**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
Silver	ND		0.39	mg/Kg-dry	1	9/28/2017 02:24 AM
Zinc	**39**		**0.77**	**mg/Kg-dry**	1	9/28/2017 02:24 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.9**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-5
Collection Date: 9/18/2017 02:08 AM

Work Order: 1709984
Lab ID: 1709984-05
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MOISTURE, ASH, AND ORGANIC MATTER			**D2974-00**			Analyst: **NW**
Moisture Content - Method A (105 °C)	11		0.025	%	1	9/30/2017 12:20 PM
Ash Content - Method C (440 °C)	96		0.025	%	1	9/30/2017 12:20 PM
Organic Matter	3.8		0.025	%	1	9/30/2017 12:20 PM
PH			**SW9045D**		Prep: EXTRACT 9/19/17 18:20	Analyst: **JB**
pH	7.50		0.100	s.u.	1	9/21/2017 10:50 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984
Sample ID: TS-6
Lab ID: 1709984-06
Collection Date: 9/18/2017 02:27 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.021**		**0.014**	**mg/Kg-dry**	1	9/28/2017 05:11 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**3.5**		**0.44**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Barium	**28**		**0.44**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Cadmium	ND		0.87	mg/Kg-dry	1	9/28/2017 02:31 AM
Chromium	**6.0**		**0.44**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Copper	**5.6**		**0.87**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Lead	**13**		**0.44**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Selenium	**1.5**		**0.87**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
Silver	ND		0.44	mg/Kg-dry	1	9/28/2017 02:31 AM
Zinc	**25**		**0.87**	**mg/Kg-dry**	1	9/28/2017 02:31 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.0**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-7
Collection Date: 9/18/2017 02:28 AM

Work Order: 1709984
Lab ID: 1709984-07
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.023**		**0.014**	**mg/Kg-dry**	1	9/28/2017 05:13 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**6.4**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Barium	**35**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Cadmium	ND		0.78	mg/Kg-dry	1	9/28/2017 02:37 AM
Chromium	**8.1**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Copper	**8.8**		**0.78**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Lead	**22**		**0.39**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Selenium	**1.5**		**0.78**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
Silver	ND		0.39	mg/Kg-dry	1	9/28/2017 02:37 AM
Zinc	**34**		**0.78**	**mg/Kg-dry**	1	9/28/2017 02:37 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.3**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-8
Collection Date: 9/18/2017 02:30 AM

Work Order: 1709984
Lab ID: 1709984-08
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.018**		**0.014**	**mg/Kg-dry**	1	9/28/2017 05:29 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**4.1**		**0.35**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Barium	**36**		**0.35**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Cadmium	ND		0.71	mg/Kg-dry	1	9/28/2017 02:43 AM
Chromium	**8.9**		**0.35**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Copper	**8.2**		**0.71**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Lead	**22**		**0.35**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Selenium	**1.5**		**0.71**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
Silver	ND		0.35	mg/Kg-dry	1	9/28/2017 02:43 AM
Zinc	**36**		**0.71**	**mg/Kg-dry**	1	9/28/2017 02:43 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.3**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Work Order: 1709984
Sample ID: TS-9
Lab ID: 1709984-09
Collection Date: 9/18/2017 02:31 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 9/28/17 10:41		Analyst: **RSH**
Mercury	**0.020**		**0.015**	**mg/Kg-dry**	1	9/28/2017 05:31 PM
METALS ANALYSIS BY ICP			**SW846 6010C**	Prep: SW3050B 9/25/17 11:35		Analyst: **HBA**
Arsenic	**4.4**		**0.38**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Barium	**39**		**0.38**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Cadmium	ND		0.76	mg/Kg-dry	1	9/28/2017 02:49 AM
Chromium	**11**		**0.38**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Copper	**9.4**		**0.76**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Lead	**27**		**0.38**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Selenium	**1.6**		**0.76**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
Silver	ND		0.38	mg/Kg-dry	1	9/28/2017 02:49 AM
Zinc	**43**		**0.76**	**mg/Kg-dry**	1	9/28/2017 02:49 AM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**9.5**		**0.050**	**% of sample**	1	9/27/2017 08:15 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *24-Oct-17*

Client: Engineering & Environmental Solutions
Project: Ryan Inc HBPW
Sample ID: TS-10
Collection Date: 9/18/2017 02:32 AM

Work Order: 1709984
Lab ID: 1709984-10
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor		Date Analyzed
MOISTURE, ASH, AND ORGANIC MATTER			**D2974-00**				Analyst: **NW**
Moisture Content - Method A (105 °C)	9.0		0.025	%	1		9/30/2017 12:20 PM
Ash Content - Method C (440 °C)	96		0.025	%	1		9/30/2017 12:20 PM
Organic Matter	3.6		0.025	%	1		9/30/2017 12:20 PM
PH			**SW9045D**		Prep: EXTRACT	9/19/17 18:20	Analyst: **JB**
pH	7.55		0.100	s.u.	1		9/21/2017 10:50 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: I

ALS Group, USA

Date: 24-Oct-17

Client: Engineering & Environmental Solutions

Work Order: 1709984

Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **108121** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-108121-108121** Units: **mg/Kg** Analysis Date: **9/28/2017 04:20 PM**

Client ID: Run ID: **HG1_170928A** SeqNo: **4667300** Prep Date: **9/28/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-108121-108121** Units: **mg/Kg** Analysis Date: **9/28/2017 04:22 PM**

Client ID: Run ID: **HG1_170928A** SeqNo: **4667301** Prep Date: **9/28/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1558	0.020	0.1665	0	93.6	80-120	0			

MS Sample ID: **1709984-07AMS** Units: **mg/Kg** Analysis Date: **9/28/2017 05:16 PM**

Client ID: **TS-7** Run ID: **HG1_170928A** SeqNo: **4667347** Prep Date: **9/28/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1412	0.017	0.1376	0.0206	87.6	75-125	0			

MSD Sample ID: **1709984-07AMSD** Units: **mg/Kg** Analysis Date: **9/28/2017 05:26 PM**

Client ID: **TS-7** Run ID: **HG1_170928A** SeqNo: **4667356** Prep Date: **9/28/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1466	0.017	0.1395	0.0206	90.3	75-125	0.1412	3.8	35	

The following samples were analyzed in this batch:

1709984-01A	1709984-02A	1709984-03A
1709984-04A	1709984-06A	1709984-07A
1709984-08A	1709984-09A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **107822** Instrument ID **ICP2** Method: **SW846 6010C**

MBLK Sample ID: **MBLK-107822-107822** Units: **mg/Kg** Analysis Date: **9/27/2017 09:50 PM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662613** Prep Date: **9/22/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	0.167	0.50								J
Chromium	0.0905	0.25								J
Copper	ND	0.50								
Lead	ND	0.25								
Selenium	ND	0.50								
Silver	ND	0.25								
Zinc	ND	0.50								

LCS Sample ID: **LCS-107822-107822** Units: **mg/Kg** Analysis Date: **9/27/2017 09:56 PM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662614** Prep Date: **9/22/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.07	0.25	5	0	101	80-120	0			
Barium	5.503	0.25	5	0	110	80-120	0			
Cadmium	5.414	0.50	5	0	108	80-120	0			
Chromium	5.942	0.25	5	0	119	80-120	0			
Copper	5.441	0.50	5	0	109	80-120	0			
Lead	5.558	0.25	5	0	111	80-120	0			
Selenium	4.97	0.50	5	0	99.4	80-120	0			
Silver	5.555	0.25	5	0	111	80-120	0			
Zinc	5.348	0.50	5	0	107	80-120	0			

MS Sample ID: **17091277-01AMS** Units: **mg/Kg** Analysis Date: **9/27/2017 10:16 PM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662617** Prep Date: **9/22/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	18.84	0.33	6.693	9.011	147	75-125	0			S
Barium	374.3	0.33	6.693	362.6	174	75-125	0			SO
Cadmium	9.104	0.67	6.693	0.9035	123	75-125	0			
Chromium	22.09	0.33	6.693	10.13	179	75-125	0			S
Copper	27	0.67	6.693	18.28	130	75-125	0			S
Lead	23.1	0.33	6.693	13.89	138	75-125	0			S
Selenium	8.64	0.67	6.693	1.729	103	75-125	0			
Silver	7.716	0.33	6.693	-0.2624	119	75-125	0			
Zinc	84.66	0.67	6.693	74.71	149	75-125	0			SO

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **107822** Instrument ID **ICP2** Method: **SW846 6010C**

MSD Sample ID: **17091277-01AMSD** Units: **mg/Kg** Analysis Date: **9/27/2017 10:23 PM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662618** Prep Date: **9/22/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	16.93	0.34	6.729	9.011	118	75-125	18.84	10.7	20	
Barium	439	0.34	6.729	362.6	1130	75-125	374.3	15.9	20	SO
Cadmium	8.965	0.67	6.729	0.9035	120	75-125	9.104	1.54	20	
Chromium	20.62	0.34	6.729	10.13	156	75-125	22.09	6.84	20	S
Copper	24.14	0.67	6.729	18.28	87	75-125	27	11.2	20	
Lead	21.88	0.34	6.729	13.89	119	75-125	23.1	5.41	20	
Selenium	8.909	0.67	6.729	1.729	107	75-125	8.64	3.07	20	
Silver	7.766	0.34	6.729	-0.2624	119	75-125	7.716	0.642	20	
Zinc	86.21	0.67	6.729	74.71	171	75-125	84.66	1.82	20	SO

The following samples were analyzed in this batch: 1709984-01A 1709984-02A 1709984-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Batch ID: **107894** Instrument ID **ICP2** Method: **SW846 6010C**

MBLK Sample ID: **MBLK-107894-107894** Units: **mg/Kg** Analysis Date: **9/25/2017 03:58 PM**
Client ID: Run ID: **ICP2_170925A** SeqNo: **4656593** Prep Date: **9/25/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	0.0635	0.50								J
Chromium	0.073	0.25								J
Copper	ND	0.50								
Lead	ND	0.25								
Selenium	ND	0.50								
Silver	ND	0.25								
Zinc	0.1035	0.50								J

LCS Sample ID: **LCS-107894-107894** Units: **mg/Kg** Analysis Date: **9/25/2017 04:04 PM**
Client ID: Run ID: **ICP2_170925A** SeqNo: **4656594** Prep Date: **9/25/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.7	0.25	5	0	94	80-120	0			
Barium	4.935	0.25	5	0	98.7	80-120	0			
Cadmium	5.113	0.50	5	0	102	80-120	0			
Chromium	5.402	0.25	5	0	108	80-120	0			
Copper	5.044	0.50	5	0	101	80-120	0			
Lead	5.257	0.25	5	0	105	80-120	0			
Selenium	4.43	0.50	5	0	88.6	80-120	0			
Silver	4.94	0.25	5	0	98.8	80-120	0			
Zinc	5.834	0.50	5	0	117	80-120	0			

MS Sample ID: **17091287-03AMS** Units: **mg/Kg** Analysis Date: **9/25/2017 04:46 PM**
Client ID: Run ID: **ICP2_170925A** SeqNo: **4656599** Prep Date: **9/25/2017** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	13.11	3.2	6.46	5.676	115	75-125	0			
Barium	66.39	3.2	6.46	63.6	43.3	75-125	0			SO
Cadmium	14.15	6.5	6.46	6.508	118	75-125	0			
Chromium	337.1	3.2	6.46	360.7	-364	75-125	0			SO
Copper	175.2	6.5	6.46	194.7	-302	75-125	0			SO
Lead	473.9	3.2	6.46	449.2	383	75-125	0			SO
Selenium	315.3	6.5	6.46	299.4	247	75-125	0			SO
Silver	13.57	3.2	6.46	6.959	102	75-125	0			
Zinc	14470	6.5	6.46	14160	4850	75-125	0			SEO

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **107894** Instrument ID **ICP2** Method: **SW846 6010C**

MS Sample ID: **17091287-03AMS** Units: **mg/Kg** Analysis Date: **9/28/2017 01:20 AM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662645** Prep Date: **9/25/2017** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Zinc	17080	65	6.46	15560	23600	75-125	0			SO

MSD Sample ID: **17091287-03AMSD** Units: **mg/Kg** Analysis Date: **9/25/2017 04:52 PM**
Client ID: Run ID: **ICP2_170925A** SeqNo: **4656600** Prep Date: **9/25/2017** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.92	3.2	6.443	5.676	96.9	75-125	13.11	9.54	20	
Barium	62.89	3.2	6.443	63.6	-11	75-125	66.39	5.42	20	SO
Cadmium	13.6	6.4	6.443	6.508	110	75-125	14.15	3.98	20	
Chromium	296.4	3.2	6.443	360.7	-998	75-125	337.1	12.9	20	SO
Copper	184.5	6.4	6.443	194.7	-159	75-125	175.2	5.13	20	SO
Lead	466.2	3.2	6.443	449.2	265	75-125	473.9	1.63	20	SO
Selenium	303.4	6.4	6.443	299.4	62.7	75-125	315.3	3.84	20	SO
Silver	12.56	3.2	6.443	6.959	87	75-125	13.57	7.67	20	
Zinc	14170	6.4	6.443	14160	168	75-125	14470	2.11	20	SEO

MSD Sample ID: **17091287-03AMSD** Units: **mg/Kg** Analysis Date: **9/28/2017 01:26 AM**
Client ID: Run ID: **ICP2_170927B** SeqNo: **4662646** Prep Date: **9/25/2017** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Zinc	16270	64	6.443	15560	11100	75-125	17080	4.84	20	SO

The following samples were analyzed in this batch:

1709984-04A	1709984-06A	1709984-07A
1709984-08A	1709984-09A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **109344** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-109344-109344** Units: **mg/L** Analysis Date: **10/20/2017 06:14 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714279** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	ND	0.0050								

LCS Sample ID: **LCS-109344-109344** Units: **mg/L** Analysis Date: **10/20/2017 06:20 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714283** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.09687	0.0050	0.1	0	96.9	80-120	0			

MS Sample ID: **17101137-01AMS** Units: **mg/L** Analysis Date: **10/20/2017 06:24 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714286** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	1.001	0.050	1	0.00078	100	75-125	0			

MSD Sample ID: **17101137-01AMSD** Units: **mg/L** Analysis Date: **10/20/2017 06:26 P**
Client ID: Run ID: **ICPMS3_171020A** SeqNo: **4714287** Prep Date: **10/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	1.032	0.050	1	0.00078	103	75-125	1.001	2.97	20	

The following samples were analyzed in this batch: 1709984-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **107624** Instrument ID **WETCHEM** Method: **SW9045D**

LCS Sample ID: **LCS-107624-107624** Units: **s.u.** Analysis Date: **9/21/2017 10:50 AM**
Client ID: Run ID: **WETCHEM_170921B** SeqNo: **4649898** Prep Date: **9/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	4.04	0.10	4	0	101	90-110	0			

DUP Sample ID: **17091032-01A DUP** Units: **s.u.** Analysis Date: **9/21/2017 10:50 AM**
Client ID: Run ID: **WETCHEM_170921B** SeqNo: **4649901** Prep Date: **9/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	7.82	0.10	0	0	0	0-0	7.62	2.59	20	

DUP Sample ID: **17091032-03A DUP** Units: **s.u.** Analysis Date: **9/21/2017 10:50 AM**
Client ID: Run ID: **WETCHEM_170921B** SeqNo: **4649903** Prep Date: **9/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	7.37	0.10	0	0	0	0-0	7.38	0.136	20	

The following samples were analyzed in this batch: 1709984-05A 1709984-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **R220984** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R220984** Units: **% of sample** Analysis Date: **9/27/2017 08:15 PM**
Client ID: Run ID: **MOIST_170927H** SeqNo: **4663412** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R220984** Units: **% of sample** Analysis Date: **9/27/2017 08:15 PM**
Client ID: Run ID: **MOIST_170927H** SeqNo: **4663411** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.98	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **17091324-12B DUP** Units: **% of sample** Analysis Date: **9/27/2017 08:15 PM**
Client ID: Run ID: **MOIST_170927H** SeqNo: **4663391** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	27.66	0.050	0	0	0	0-0	28.42	2.71	5	

DUP Sample ID: **17091324-18B DUP** Units: **% of sample** Analysis Date: **9/27/2017 08:15 PM**
Client ID: Run ID: **MOIST_170927H** SeqNo: **4663399** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	22.63	0.050	0	0	0	0-0	24.05	6.08	5	R

The following samples were analyzed in this batch:

1709984-01A	1709984-02A	1709984-03A
1709984-04A	1709984-05A	1709984-06A
1709984-07A	1709984-08A	1709984-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 1709984
Project: Ryan Inc HBPW

QC BATCH REPORT

Batch ID: **R221200** Instrument ID **WETCHEM** Method: **D2974-00**

MBLK Sample ID: **MB-R221200-R221200** Units: **%** Analysis Date: **9/30/2017 12:20 PM**
Client ID: Run ID: **WETCHEM_170930G** SeqNo: **4670007** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture Content - Method A (105 °C)	ND	0.025								
Ash Content - Method C (440 °C)	ND	0.025								
Organic Matter	ND	0.025								

DUP Sample ID: **1709984-05A DUP** Units: **%** Analysis Date: **9/30/2017 12:20 PM**
Client ID: **TS-5** Run ID: **WETCHEM_170930G** SeqNo: **4670009** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture Content - Method A (105 °C)	10.95	0.025	0	0	0	0-0	11.4	4.03	20	
Ash Content - Method C (440 °C)	96.12	0.025	0	0	0	0-0	96.18	0.0624	20	
Organic Matter	3.88	0.025	0	0	0	0-0	3.82	1.56	20	

The following samples were analyzed in this batch: 1709984-05A 1709984-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

ALS Environmental

Chain of Custody Form

Page ____ of ____

COC ID: 38734

ALS Project Manager: | ALS Work Order #: 1709984

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Ryan Inc (metals) & HBPH (other)	A	MI-10 metals
Work Order		Project Number	032-17-001 to 133-17-00	B	PH
Company Name	Engineering & Environmental Solutions	Bill To Company	Engineering & Environmental Solutions	C	organic content
Send Report To	Blaine Littral	Invoice Attn		D	
Address	400 136th Ave Bldg 100, Suite B	Address	400 136th Ave Bldg 100, Suite B	E F	
City/State/Zip	Holland, MI 49424	City/State/Zip	Holland, MI 49424	G	
Phone	(616) 931-3967	Phone	(616) 931-3967	H	
Fax	(616) 931-3970	Fax	(616) 931-3970	I	
e-Mail Address		e-Mail Address	blaine.littral@goEEsolutions.net	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	TS-1	9-18-17	2:05	topsoil			X										
2	TS-2		2:06				X										
3	TS-3		2:06				X										
4	TS-4		2:07				X										
5	TS-5		2:08					X	X								
6	TS-6		2:27				X										
7	TS-7		2:28				X										
8	TS-8		2:30				X										
9	TS-9		2:31				X										
10	TS-10		2:32					X	X								

Sampler(s) Please Print & Sign: Mitchell Stark

Shipment Method:

Turnaround Time in Business Days (BD): [X] 10 BD [ ] 5 BD [ ] 3 BD [ ] 2 BD [ ] 1 BD [ ] Other

Results Due Date:

Relinquished by: Mitchell Stark | Date: 9/18 | Time: 5:05 pm | Received by:

Relinquished by: | Date: 9/18/17 | Time: 1505 | Received by (Laboratory):

Logged by (Laboratory): MJF | Date: 9-18-17 | Time: 1580 | Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
SR2	3.4

QC Package: (Check One Box Below)
- [ ] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SW846/CLP
- [ ] Other
- [ ] TRRP Checklist
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **18-Sep-17 15:30**

Work Order: **1709984** Received by: **DS**

Checklist completed by Nicole Fredericks eSignature 18-Sep-17 Date Reviewed by: Bill Carey eSignature 18-Sep-17 Date

Matrices: Soil

Carrier name: Client

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):	3.4/3.4	sr2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	9/18/20173:38:59 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:

Revision: 1

APPENDIX E

MDEQ CORRESPONDENCE

Closure Plan

CCR Surface Impoundment System
James DeYoung Power Plant
Holland, Michigan

Holland Board of Public Works
Holland, MI

October 17, 2016
NTH Project No. 73-160017-01

NTH Consultants, Ltd.
41780 Six Mile Road
Northville, MI 48168

TABLE OF CONTENTS

INTRODUCTION

The Holland Board of Public Works (BPW) owns and operates the James DeYoung (JDY) plant located in Holland, Michigan, on the eastern end of Lake Macatawa. JDY was initially built in 1939 with a generating capacity of 15 MW. Between 1953 and 1968, three new boilers were added. Since the late 1970's, the plant has consisted of three coal-fired boilers capable of producing up to 62.5 MW (Unit 3 is 11.5 MW; Unit 4 is 22 MW; and Unit 5 is 29 MW). BPW has discontinued the use of Unit 3, and coal is no longer utilized in Units 4 and 5 as of May 20, 2016. Units 4 and 5 are now operating only on natural gas. Bottom ash from these boiler units was historically sluiced to three surface impoundments throughout operations of the plant when Units 3-5 were operating on coal. The surface impoundments are located to the south of the plant, as shown on Figure 1.

These surface impoundments are considered CCR units and regulated under the recently promulgated rules regulating ash disposal from coal-fired power plants (40 CFR Part 257). In June 2016, BPW initiated removal of CCR material from the CCR units and closure of the CCR units will be completed in accordance with 40 CFR §257.101 and 40 CFR §257.103.

This Closure Plan (Plan) has been prepared for the facility in accordance with 40 CFR §257.102(b), and describes the process that BPW plans to follow in closing the CCR units at the JDY plant. The closure of a CCR surface impoundment must be completed either by leaving the CCR in-place and installing a final cover system, or through removal of the CCR and decontamination of the CCR unit in accordance with 40 CFR §257.102(a). The objectives of this Plan are to describe the methods and procedures for closure and provide a schedule for completion of closure activities. The Plan also provides methods BPW will employ in determining whether the CCR closure goals have been achieved.

Initial Investigation

Representatives from NTH Consultants, Ltd. (NTH) and Engineering and Environmental Solutions, LLC (E&E) conducted a field investigation on June 23-24, 2016 to estimate the horizontal and vertical extent of CCR managed as part of the ash pond system. The field investigation consisted of both a topographical survey and collection of soil borings for visual observation. Field data collected during this investigation provided a better understanding of current conditions in and around the CCR units and was used to assist in the evaluation of the volume of CCR in-place, along with developing a closure strategy of the CCR units in accordance with 40 CFR §257.102.

NTH and E&E also completed an on-site review of available site documentation on May 18, 2016 and a historical aerial imagery review of the JDY plant from publicly-available sources. Images were obtained dating back to 1938 through 2014. This information was used to help estimate the horizontal extent of the CCR units. The historical imagery assisted in showing probable horizontal extent and locations of the ash pond systems since 1961. Boring locations were selected along certain traverses, as outlined in Figure 2, based on historical imagery of locations that CCR was likely to have been stored or managed. The borings were utilized to develop cross sections A-A, B-B, C-C, D-D, and E-E (Figures 3 and 4). Soil borings were obtained using a Geoprobe® rig for most cross sections; however, due to proximity of underground utilities along the northern portion of Pond 1, hand augers were required for cross section A-A.

Regulatory Basis

Closure of CCR units must be completed either by leaving the CCR in-place and installing a final cover system or through removal of the CCR and decontamination of the CCR units in accordance with 40 CFR §257.102(a). Holland BPW is currently considering closure options, and is initially planning to implement a closure strategy utilizing a clean closure approach. Preliminary evaluation of the available data indicates that removal of the CCR and decontamination of the CCR units might be the most appropriate closure strategy for the facility. At a minimum, the facility will ensure that the closure of the CCR units meets the performance standards established in 40 CFR §257.102(c) and is consistent with recognized and generally accepted good engineering practices.

CLOSURE PROCEDURES

BPW intends to close the CCR surface impoundments by removing and decontaminating areas affected by releases from the CCR units (clean closure). CCR removal and decontamination of the CCR units will be considered complete when constituent concentrations throughout the CCR units and areas affected by releases from the CCR units have been removed. As discussed in the preamble of the final rule (FR, Vol. 80.No 74, pp 21412), removal means "contaminants left in the subsoils (i.e., contaminated groundwater left in soils below the former landfill or impoundment) will not impact any environmental media including groundwater, surface water, or the atmosphere in excess of Agency recommended limits or factors. Typically, any metals in these 'subsoils' in excess of background levels are allowed to either naturally attenuate, or are removed by flushing. Once the facility has removed all of the assessment monitoring constituents listed in appendix IV to background levels or MCLs, the groundwater is considered to be 'clean' and closure is complete." In other words, removal of contaminated media until groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to 40 CFR §257.95(h) for constituents listed in Appendix IV, or statistically developed background concentrations. The procedures described below have been developed to achieve the performance standards specified in 40 CFR §257.102(c) and to ensure that the CCR impoundment closure goals are attained.

Contaminated materials will be removed from the CCR units following recognized and generally accepted good engineering practices. In general, closure of the CCR units will proceed with the following major steps:

1. Drainage and stabilization
2. Excavation and removal
3. Confirmation of clean closure
4. Groundwater evaluation, decontamination, and analysis
5. Backfilling
6. Erosion and storm water control

Drainage and Stabilization

The facility will eliminate free liquids by removing liquid waste through agitating and pumping to the extent that conventional pumping equipment will allow, or solidifying the remaining wastes not affected by a release from the CCR units. Should groundwater be encountered in sufficient quantities, the contractor will remove the groundwater or surface water for proper disposal and take necessary measures to minimize groundwater from coming in contact with the CCR material. The remaining wastes will be sufficiently stabilized to support construction activities and for the long-term, final configuration. The closure construction documentation will stipulate appropriate methods to dewater areas of the CCR units, including the installation of pumps or well points to control surface water and groundwater flow into the CCR units, or other means. The water removed from the ash during drainage and stabilization will be discharged under an authorized permit from the appropriate authority having jurisdiction, and meet the applicable contaminant loading limits set forth in the permit and 40 CFR §257.95(h), Appendix IV, or statistically-defined background levels by pre-treatment, if necessary.

Excavation and Removal

The CCR material will be mechanically excavated from the CCR units to the level of the underlying existing native soils. Excavation and removal of contaminated media will be completed such that groundwater left in soils below the former landfill or impoundment will not impact environmental media in excess of Agency recommended limits or factors. The closure construction documentation will stipulate the appropriate procedures for excavation and removal. Material removed from the impoundments will be dewatered before disposal at a licensed disposal facility.

Fugitive Dust Control

If airborne dust/particulates are observed during removal of the CCR, the areas of non-vegetative ground surface, open excavations, or stockpiled material will be sprayed with water or an approved dust suppressant agent, as necessary, to prevent airborne dispersion and off-site migration of particulates.

Fugitive dust on site roads will be minimized through the use and enforcement of a speed limit of 10 miles per hour on site. On-site dust generation may also be reduced by temporarily paving or placing gravel on the primary construction roads.

Measures will also be taken to prevent "track-out" of soil from the site onto nearby streets. Possible methods may include avoiding over-watering unpaved areas (which creates mud and promotes more track-out), installing a gravel access road, using paved aprons or wheel washers to remove materials from vehicles before they leave the site, and cleaning any track-out with vacuum sweepers.

Confirmation of Clean Closure

In accordance with 40 CFR §257.102(c), any areas are affected by releases from CCR units will be decontaminated. The facility will make a determination regarding potential releases from the CCR units after a review of the results of the additional investigative activities is completed and, if merited, will decontaminate the underlying and surrounding soils, by additional soil excavation, flushing, pumping and/or treating of the aquifer.

After removal of material is complete, as an example, when visible evidence of CCR is removed, we will conduct an evaluation to determine if potential impacts from CCR remain. Sample design will be consistent with applicable agency documents such as the Verification of Remediation procedures as described in the Michigan Department of Environmental Quality's 2002 Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria (S3TM document). For example, if the area to be evaluated is less than approximately one-quarter acre, verification of remediation will follow a biased sampling strategy and the number of samples will be consistent with those indicated in Tables 1.1 and 1.2 in Tab 4 of the S3TM document. Sample locations will be biased towards areas most likely to exceed cleanup criteria, and exclude areas with material designated as inert by the Department. A demonstration will be made that the remaining soil meets the appropriate standard by comparing the laboratory results to the applicable standard on a point-by- point basis, as described in Chapter 1.4 of Tab 4 of the S3TM document. Applicable standards may include the statewide default background level, regional background concentrations (for the appropriate glacial lobe and soil type) as indicated in the

Michigan Background Soil Survey (Updated 2015), or to a site-specific background concentration determined in accordance with Chapters 1.2.2 and 4.3 of Tab 4 of the S3TM document.

Alternatively, if the area to be evaluated is greater than one-quarter acre, a selected option for the verification of remediation may follow a statistical sampling strategy and the number of samples will be calculated based on the area of the excavation as described in Chapters 2.2.1.2 and 2.3.1 of Tab 4 of the S3TM document.

Groundwater Evaluation, Decontamination, and Analysis

Concurrent with excavation and removal of the CCR material, BPW will develop a groundwater monitoring program to comply with the requirements of 40 CFR §257.91. The design of the groundwater monitoring system will be representative of groundwater potentially affected by the CCR units and provide a determination of the quality of groundwater passing the waste boundary of the CCR units. At a minimum, four monitoring wells (one upgradient and three downgradient) will be installed by October 17, 2017 at appropriate locations and depths to yield representative groundwater samples from the uppermost aquifer.

Groundwater samples will be collected from the monitoring system and analyzed for constituents listed in Appendix IV of 40 CFR §257.95, after removal of the CCR material and decontamination of the CCR units have been completed. Results of the groundwater samples will be compared to groundwater standards for determination of clean closure.

The groundwater protection standards for each constituent in Appendix IV will be established in accordance with 40 CFR §257.95(h). For constituents for which a maximum contaminant level (MCL) has been established under 40 CFR §141.62 and 40 CFR §141.66, the groundwater protection standard will be the MCL for that constituent. Where MCLs have not been established for a constituent, the groundwater protections standard will be the statistically developed background concentration for that constituent in accordance with 40 CFR §257.91, or as previously referenced from the preamble to the rule “in excess of Agency-recommended limits or factors.” For those constituents for which the statistically developed background level is higher

than the MCL, the groundwater protection standard will be the statistically developed background concentration.

If results of groundwater analysis indicate exceedances of the groundwater protection standards, groundwater decontamination may be completed and monitoring continued on a semi-annual basis until groundwater protection standards are met.

Backfilling

After removal of the CCR material and dewatering of the CCR units, the CCR units will be backfilled with clean soil backfill or a stone/sand backfill material. The fill will be placed in general 12-inch thick lifts, compacted with equipment appropriate for the soil type to at least 90% of the modified proctor (ASTM D1557), or equivalent, or as determined suitable in the field for stable construction sequencing.

Slope Stability and Erosion Control Provisions

Given the site topographical characteristics and the nature of the incised CCR surface impoundments, major slope stability and/or erosion or sloughing concerns are not warranted at the facility. Since the impoundments are incised, subgrade preparation will include backfilling the impoundments with earthen material after removal of CCR material. Final topographical configuration of the area over the impoundments will consist of slopes likely not exceeding 10 percent grade and should not create concern for significant slope stability or sloughing. Additionally, the final site configuration will have an erosion control layer and vegetative cover consisting of grass that will preclude major erosion concerns. See Figures 5 and 6 for additional information.

Erosion and Storm Water Control

The removal of the CCR material will be conducted in a manner consistent with a Soil Erosion and Sedimentation Control (SESC) Plan prepared in accordance with local and state requirements.

The SESC measures may include:

- A gravel tracking mat constructed at the Site exit to provide a zone through which loose material can dislodge from truck tires;
- The area immediately outside the Site will be periodically swept and scraped to prevent tracking of material and dispersion of dust from the Site at periodic intervals. Material will be swept back onto the Site;
- Silt fence will be installed around the perimeter of the Site to minimize the loss of soil to surrounding areas; and
- Additional measures may be utilized, if needed, to minimize erosion and help control the migration of sediments into surface water runoff.

An erosion layer consisting of four inches of earthen material that is capable of sustaining plant growth will be placed on top of the backfilled former CCR units to support vegetative growth. The erosion layer will be placed in one lift and physical thickness verification of the soil layer shall be performed at an interval stipulated in the project specifications. The entire area that has been covered will then be seeded, fertilized, and mulched per the project specifications.

The seed mixture in Table 1, or its equivalent to sustain vigorous and healthy growth, will be used for seeding the site after backfilling is complete:

Table 1: Seed Mixture

Seed Type	Percent of Seed
Perennial Rye Grass	50%
Kentucky Blue Grass	15%
Creeping Red Fescue Grass	35%

Storm Water Control and Miscellaneous Site Features

To minimize infiltration, the final grading will consist of gentle sloping grades (likely 10 percent grade or less) to promote surface water runoff drainage from the former CCR unit area to a network of perimeter storm water ditches and conveyance structures. The conveyance system will

be designed to handle the regulatory-required design storm event and discharge from the site under an appropriate jurisdictional authority storm water discharge permit.

Storm water diversion channels and conveyance ditches/structures will be constructed on top of and around the former CCR units as shown in the construction documentation. Additional features necessary for erosion control or other miscellaneous construction activities will be completed concurrent with the closure construction to ensure a complete system is installed and functional.

Documentation of construction activities for conformance with project specifications will be completed by BPW or their representative and certified by a professional engineer in the State of Michigan to have been completed in substantial conformance with the project specifications, construction documentation, and 40 CFR Part 257, as applicable.

ESTIMATE OF CCR ON-SITE AND AREA OF THE CCR UNITS

In accordance with 40 CFR §257.102(b)(iv), NTH completed an estimate of the maximum inventory of CCR on-site based on a review of the historical images, information obtained during the June 2016 field investigation, and preliminary volume calculations using AutoCAD Civil 3D®. We estimate the maximum volume of CCR that could have been in-place in all three units dating to 1961, as this is when historical imagery first indicated the presence of the ponds, was approximately as much as 26,900 cubic yards (cy).

We also completed an estimate of the largest area of CCR units requiring final cover based on a review of the historical images and estimation of the probable lateral extent of CCR obtained during the June 2016 field investigation. As required in 40 CFR §257.102(b)(v), NTH estimated the largest area of CCR units ever requiring final cover at any time during the active life to be approximately 2.0 acres using AutoCAD Civil 3D®. It should be noted that the probable largest horizontal extent of the CCR unit varied throughout plant's operational life, since the CCR was likely handled and moved as operations progressed. The estimated largest area of CCR units requiring final cover is based on the probable final disposition of CCR within the CCR surface impoundments.

CLOSURE SCHEDULE

Holland BPW is committed to closing the existing CCR impoundments as quickly as is feasible. Holland BPW anticipates that closure activities will begin in mid-2017 and that closure activities will be completed within five years of commencement, or by June 2022, pursuant to 40 CFR §257.102(f)(ii). Completion of closure activities will be dependent on the time of the year when closure occurs as seasonal variations and other unanticipated issues may delay the estimated schedule. Additional factors that can adversely impact closure schedule include complications resulting from climatic factors that result in a shortened construction season, the amount of time required to dewater due to the volume of CCR in the units or the characteristics of the CCR, geology and terrain surrounding the CCR units that will affect the amount of material needed to close the CCR units, and time delays caused by the need to coordinate with, and obtain necessary approval and permits from state and local agencies or construction vendors/ material suppliers. If any of these conditions are encountered during closure activities, the facility will provide a demonstration that completion of closure activities is not feasible due to factors beyond the facility's control and document a two-year time extension in accordance with 40 CFR 257.102(e)(2)(ii). The owner or operator will place the demonstration in the facility's operating record as required in 40 CFR 257.105(i)(5) prior to the end of the two-year period. It is estimated that all closure activities will be completed by December 2018 but no later than the regulatory prescribed deadline of June 2022. Table 2 includes the estimated closure schedule.

TABLE 2
HOLLAND BOARD OF PUBLIC WORKS
JAMES DEYOUNG PLANT
CLOSURE PLAN SCHEDULE*

Task	Oct. 2016	Nov. 2016	Dec. 2016	Jan. 2017	Feb. 2017	Mar. 2017	Apr. 2017	May. 2017	Jun. 2017	July. 2017	Aug. 2017	Sept. 2017	Oct. 2017	Nov. 2017	Dec. 2017	Jan. 2018	Feb. 2018	Mar. 2018	Apr. 2018	May. 2018	Jun. 2018	July. 2018	Aug. 2018	Sept. 2018	Oct. 2018	Nov. 2018	Dec. 2018
Complete field investigation																											
Coordinate with, and obtain necessary approvals and permits from MDEQ																											
Issue Request for Proposal for construction activities																											
Excavation and Removal of CCR material																											
Confirmation of Clean Closure																											
Groundwater Evaluation, Decontamination, and Analysis**																											
Backfilling and Erosion Controls																											
Certification Report**																											

*Completion of closure activities will be dependent on seasonal variations, climatic factors, the amount of time required to dewater, the geology and terrain surrounding the CCR units that will affect the amount of material needed to close the CCR units, and time delays caused by the need to coordinate with and obtain necessary approval and permit from state and local agencies or construction vendors/material suppliers. This preliminary schedule is subject to modifications based upon these factors.

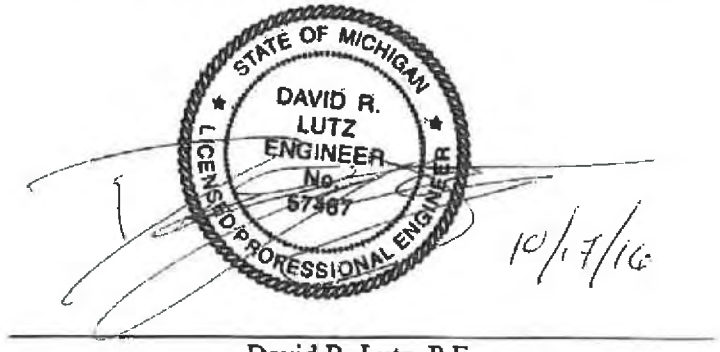
** Groundwater evaluation will be conducted as necessary during the closure period. Closure completion will be dependent on groundwater cleanup/confirmation samples.

AMENDMENT TO THE CLOSURE PLAN

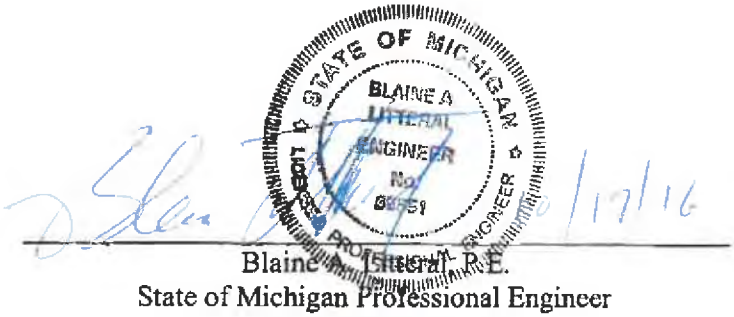
Amendments to this initial or any subsequent closure plan may be required if there are any substantial changes that will affect the written closure plan in effect. In accordance with 40 CFR §257.102(3)(iii), amendments to the plan will be completed at least 60 days prior to a planned change in the operation of the facility or CCR unit, or no later than 60 days after an unanticipated event requires the need to revise the existing written closure plan. If the closure plan is revised after closure activities have commenced for a CCR unit, the facility will amend the current closure plan no later than 30 days following the triggering event. In accordance with 40CFR §257.102(b)(4), any amendments to the plan will be certified by a qualified professional engineer.

STATEMENT OF CERTIFICATION

I, David R. Lutz and Blaine A. Litteral, Professional Engineers licensed in the State of Michigan, certify[1] that, NTH and E&E Solutions have reviewed the historical information, conducted the limited field investigation, and prepared the closure plan for the Holland Board of Public Works James DeYoung Power Plant in Holland, Michigan CCR surface impoundments (Ash Ponds 1-3), as presented above. To the best of my knowledge and belief, the closure plan presented in this report for the CCR surface impoundments at the aforementioned facility has been prepared in substantial conformance the requirements established in 40 CFR 257.102 (b).



David R. Lutz, P.E.
State of Michigan Professional Engineer
Registration No. 57487



Blaine A. Litteral, P.E.
State of Michigan Professional Engineer
Registration No. 36551

[1] I am rendering my professional opinion based on the information available to me at the time of this report writing. This certification does not comprise a guarantee or warranty that certain conditions exist, nor does it relieve any other party of their requirements to abide by all applicable local, state, and federal regulations, and to honor all express or customary guarantees and warranties associated with their work.

ATTACHMENTS

- FIGURE 1: SITE LOCATION PLAN
- COVER SHEET - FIGURES 2 THRU 4
- FIGURE 2: EXISTING CONDITIONS
- FIGURE 3: CROSS SECTIONS A-A', B-B' & C-C'
- FIGURE 4: CROSS SECTIONS D-D' & E-E'
- FIGURE 5: PROPOSED GRADING PLAN
- FIGURE 6: PROPOSED GRADING PROFILE

NTH PROJECT No.: 62-160017	CAD FILE NAME: 160017-JDY
DESIGNED BY: SLG	PLOT DATE: 10/4/2016
DRAWN BY: SLG	DRAWING SCALE: 1" = 200'
CHECKED BY: DRL	INCEPTION DATE: 9/7/2016

NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

SITE LOCATION PLAN

JAMES DEYOUNG POWER PLANT
HOLLAND, MI

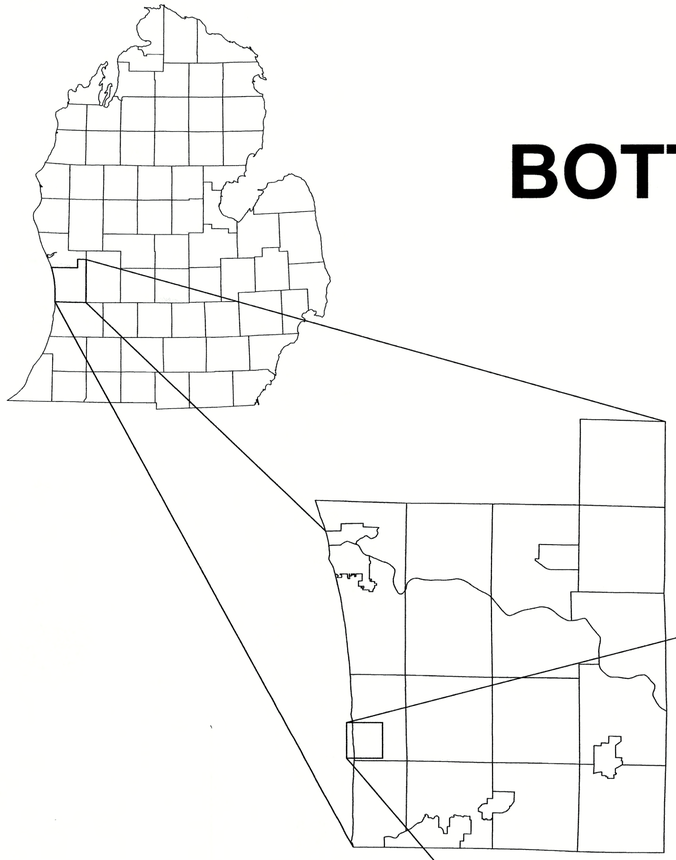
FIGURE: 1

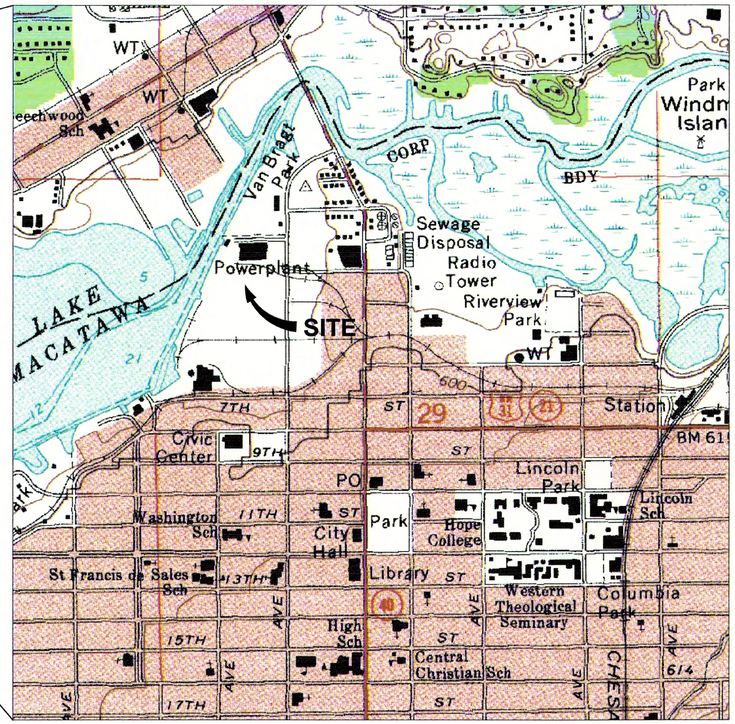
BOTTOM ASH POND INVESTIGATION

HOLLAND BOARD OF PUBLIC WORKS

PREPARED BY:
Engineering & Environmental Solutions, LLC
PROJECT NO: 133-16-001

OCTOBER 2016





64 PINE AVE, HOLLAND, MICHIGAN
SECTION 30 T. 5 N., R. 15 W.
CITY OF HOLLAND
OTTAWA COUNTY, MICHIGAN

SHEET INDEX

Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B ■ Holland, Michigan 49424 ■ Phone: (616) 994-6541 ■ Fax: (616) 931-3970 ■ www.goEESolutions.com

BOTTOM ASH POND INVESTIGATION
HOLLAND BOARD OF PUBLIC WORKS

STATE OF MICHIGAN
BLAINE LITTEN
ENGINEER
No. 58531
LICENSED PROFESSIONAL ENGINEER

LEGEND

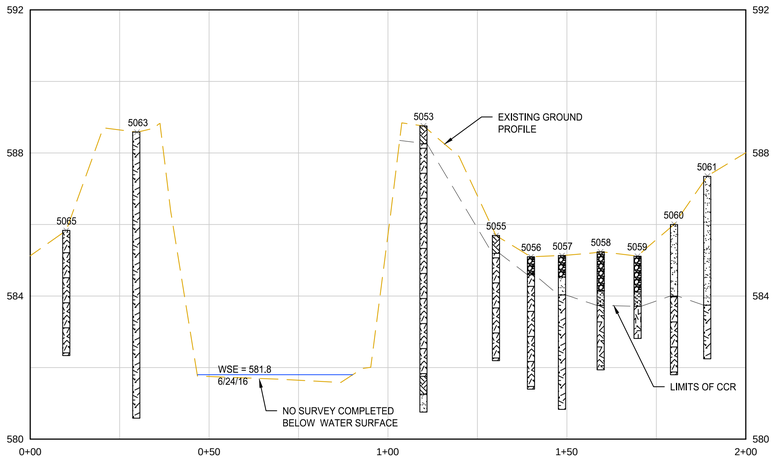
- MAJOR CONTOUR (5' INTERVAL)
- MINOR CONTOUR (1' INTERVAL)
- FENCE
- LIMITS OF ASH
- LIMITS OF COAL
- STORM SEWER
- CONCRETE
- ASPHALT

SCREEN HOUSE
LOADER GARAGE
TRUCK GARAGE
JAMES DEYOUNG POWER PLANT
LIMITS OF COAL
SLAB
APPROXIMATE LOCATION OF 2-10" ROOF DRAINS
APPROXIMATE LOCATION OF CONCRETE PAD
APPROXIMATE LOCATION OF 48" PIPE
6" STEEL PIPE
6".CONCRETE PIPE
6" STEEL INV 586.86
6" CONC INV 585.87
MANHOLE
ACCESS ROAD
COAL RUNOFF COLLECTION DITCH
CONVEYER
POND 1
BOTTOM OF BANK (TYP.)
COAL 584.79
TOP OF BANK
HOPPER
APPROXIMATE LOCATION OF 48" PIPE
24" CMP INV 585.17
24" CMP CULVERT
SHED
24" CMP INV 584.65
POND 2
24" CMP CULVERT
24" CMP INV 584.22
24" CMP INV 583.47
EDGE OF LAND
PERIMETER FENCE
LIMITS OF COAL
APPROXIMATE LOCATION OF STORM WATER PIPE
EDGE OF DOCK
LIMITS OF COAL PILE
COAL PILE
CONCRETE RETAINING WALL
POND 3
60" CONC. CULVERT INV = 572.47
APPROXIMATE LOCATION BOTTOM ASH PIPE
EXISTING WEIR SEE SHEET 5
24" PE CULVERT

5000 5001 5074 5005 5007 5009 5071 5072A 5011 5012 5013 5076 5075 5014 5019C 5019B 5019A 5017 5017A 5063 5065 5047 5050 5049 5050A 5060 5059 5058 5057 5056 5055 5053 5061 5043 5041 5036 5033 5029 5020 5026

S:\Projects\133 - NTH Consultants\133-16-001 HBPW - Ash Settling Pond and Coal Pile Closure\CADD\Basemap.dwg 10/6/2016 9:59 AM

POND 1 CROSS SECTION A-A'



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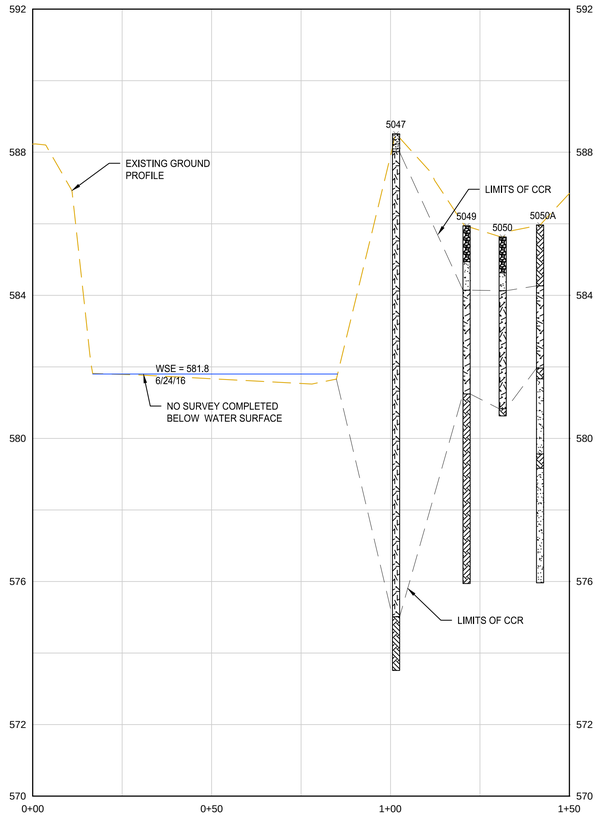
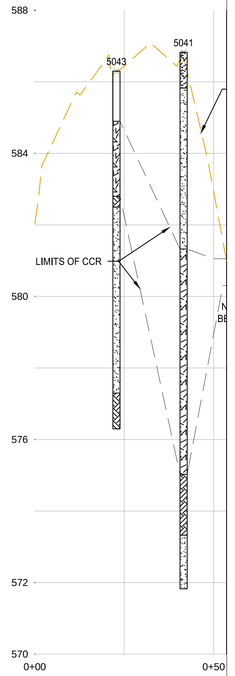


POND 2



LEGEND

- EXISTING GROUND (JUNE 2016)
- BOTTOM OF CCR SURFACE PROFILE
- GROUNDWATER
- CCR MATERIAL
- COAL
- NATIVE SAND
- NATIVE SILT AND/OR CLAY WITH ORGANICS
- CONCRETE
- GRAVEL

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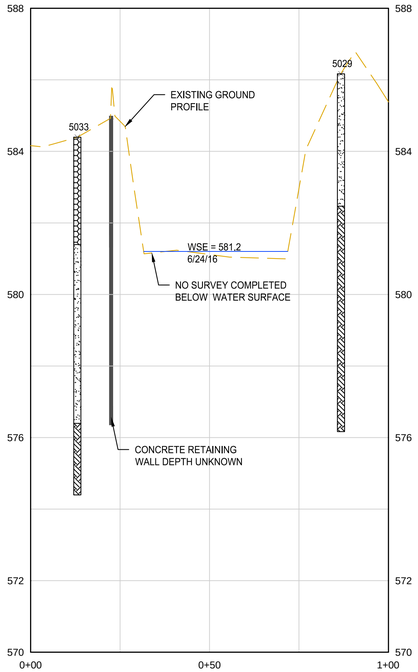
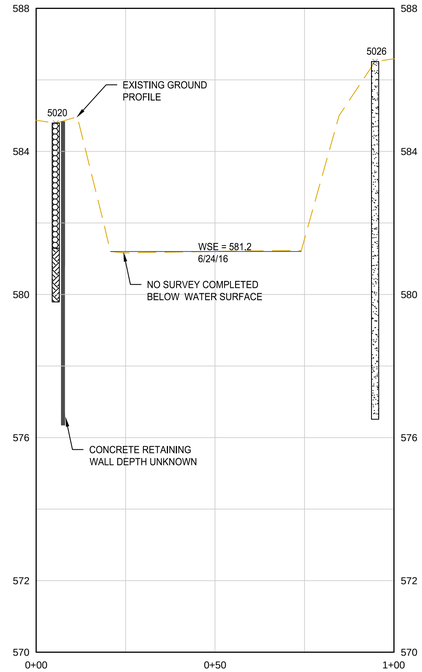
POND 3 CROSS SECTION D-D'



POND 3 CROSS SECTION E-E'



LEGEND

EXISTING GROUND (JUNE 2016)
BOTTOM OF CCR SURFACE PROFILE
GROUNDWATER

CCR MATERIAL
COAL
NATIVE SAND
NATIVE SILT AND/OR CLAY WITH ORGANICS
CONCRETE
GRAVEL

N

0 20' 40' 80'

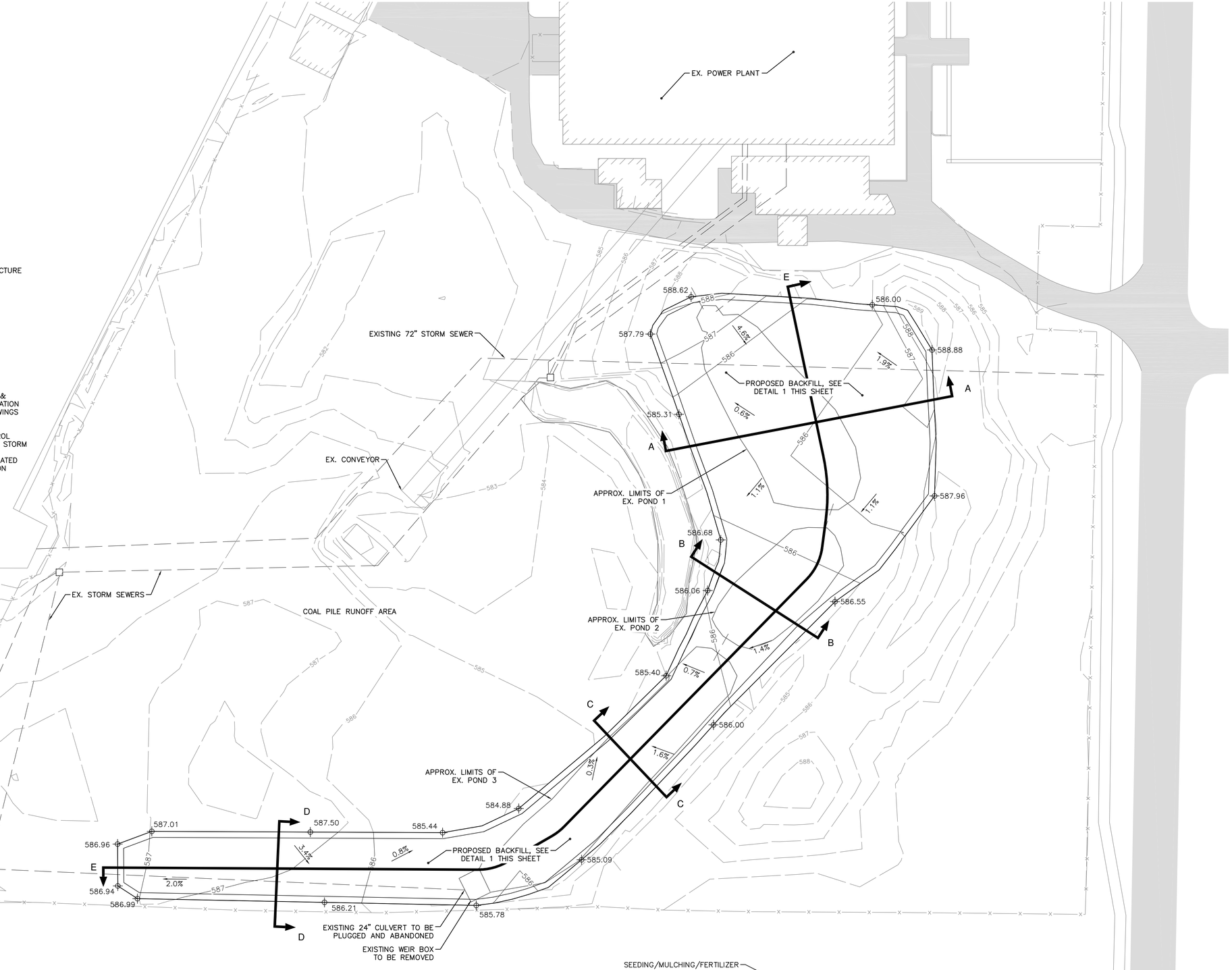
SCALE

LEGEND

- EXISTING CONTOURS (965)
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING STORM SEWER
- EXISTING STORMWATER JUNCTION STRUCTURE
- EXISTING ASPHALT
- EXISTING CONCRETE
- PROPOSED CONTOURS (960)
- PROPOSED SLOPE (1%)
- PROPOSED SPOT ELEVATION (103.00)

NOTES:

1. EXISTING TOPOGRAPHIC SURVEY COMPLETED BY ENGINEERING & ENVIRONMENTAL SOLUTIONS ON JUNE 23 AND 24, 2016. LOCATION OF PIPING IS APPROXIMATE AND BASED OFF HISTORICAL DRAWINGS PROVIDED BY HBPW.
2. STORMWATER CONTROL DITCHES, CULVERTS, OR OTHER CONTROL FEATURES TO BE DESIGNED AND INSTALLED TO CONTROL THE STORM RUNOFF FROM THE DESIGNED EVENT OF THE CLOSED CCR IMPOUNDMENT AREA. THE RUNOFF WILL OUTFALL AT A DESIGNATED LOCATION UNDER APPROPRIATE AUTHORITY HAVING JURISDICTION PERMIT.



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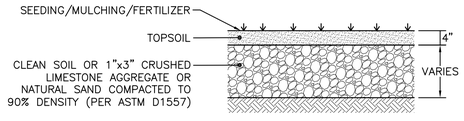
Orange	PHONE & CATV	Green	STORM DRAIN
Red	ELECTRIC	Brown	SEWER
		Pink	SURVEYING

IF YOU ARE GOING TO WORK NEAR OVERHEAD WIRES ... CALL MISS DIG



1 CCR IMPOUNDMENT BACKFILL SECTION
NOT TO SCALE

NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

Northville, MI	248.553.6300
Detroit, MI	313.237.3900
Lansing, MI	517.484.6900
Grand Rapids, MI	616.451.6270
Cleveland, OH	216.334.4040

SUBMITTAL

REV	DESCRIPTION	DATE	BY

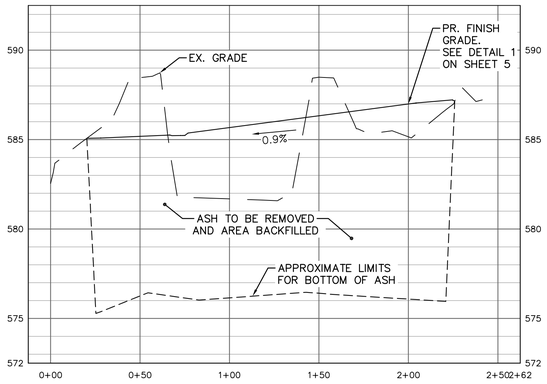
PROJECT NAME:
HOLLAND BPW ASH IMPOUNDMENT CLOSURE

PROJECT LOCATION:
JAMES DEYOUNG POWER PLANT
HOLLAND, MICHIGAN

NTH PROJECT NO.:	CAD FILE NAME:
73-160017	160017-EG-ASH
DESIGNED BY: SLG	INCEP DATE: 10/3/2016
DRAWN BY: SLG	DRAWING SCALE: 1" = 40'
CHECKED BY: DRL	SUBMITTED DATE: 10/17/2016

SHEET TITLE:
ASH IMPOUNDMENT CLOSURE PROPOSED GRADING PLAN

SHEET REFERENCE NUMBER:
5



SECTION A-A

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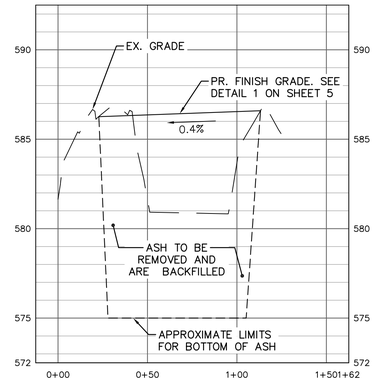
VERT SCALE: 1" = 4'



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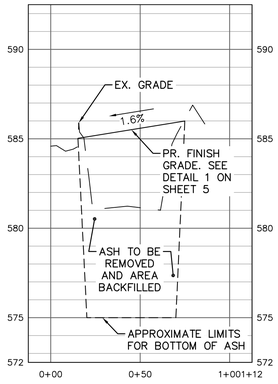

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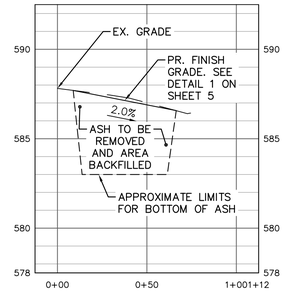

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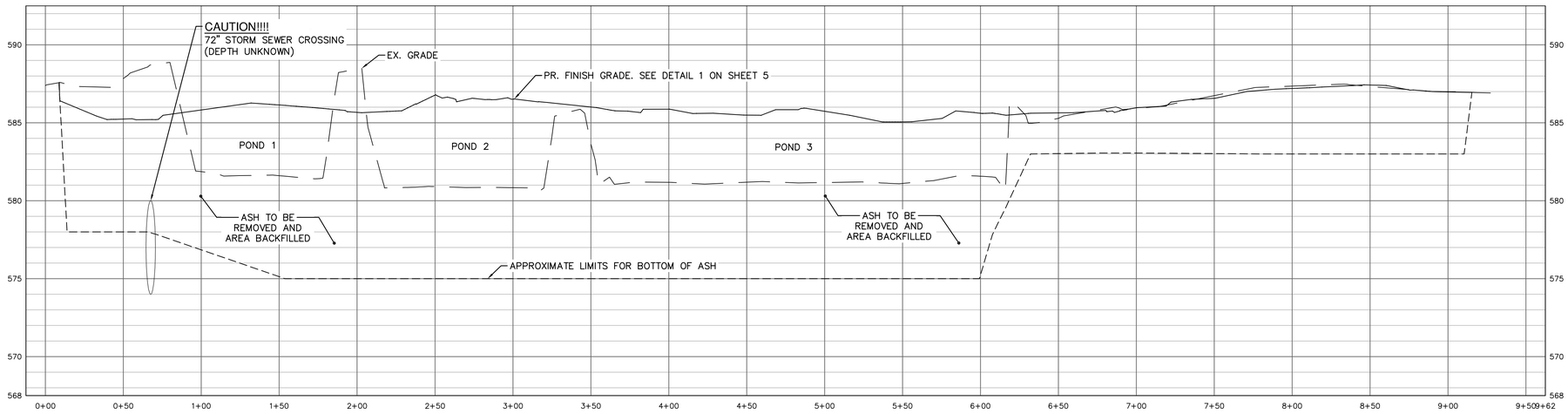

SECTION E-E

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VERT SCALE: 1" = 4'

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Infrastructure Engineering and Environmental Services

Northville, MI	248.553.6300
Detroit, MI	313.237.3900
Lansing, MI	517.484.6900
Grand Rapids, MI	616.451.6270
Cleveland, OH	216.334.4040

SUBMITTAL

REV	DESCRIPTION	DATE	BY

PROJECT NAME:

HOLLAND BPW ASH IMPOUNDMENT CLOSURE

PROJECT LOCATION:

JAMES DEYOUNG POWER PLANT
HOLLAND, MICHIGAN

NTH PROJECT NO.:	CAD FILE NAME:
73-160017	160017-EG-ASH
DESIGNED BY:	INCEP DATE:
SLG	10/3/2016
DRAWN BY:	DRAWING SCALE:
SLG	1" = 40'
CHECKED BY:	SUBMITTED DATE:
DRL	10/13/2016

SHEET TITLE:

ASH IMPOUNDMENT CLOSURE PROPOSED GRADING PROFILES

SHEET REFERENCE NUMBER:

6

J:\2016\73\160017\source drawings\surfaces\160017-eg-ash.dwg Plotted: 10/13/2016 11:55 AM by sgrant

Coal Yard Closure Plan – Coal Removal Visual Documentation Procedure
Revision 1 – August 10, 2017

Coal removal goals

Holland Board of Public Works (BPW) intends to reclaim as much coal from the site for re-use as fuel as is possible. BPW is currently in the final stages of removing and shipping offsite the upper portion of the remaining coal from the coal yard.

Once the excavation contractors have begun work on-site, one of the initial steps will be to remove the underlying layer of residual coal from the former coal yard that may contain some amounts of aggregate/soil, but which is still usable fuel. To the extent that is feasible, the usable coal mixture will be removed and transferred to facilities having boilers/combustion equipment that are capable of utilizing coal with increased amounts of soil and aggregate.

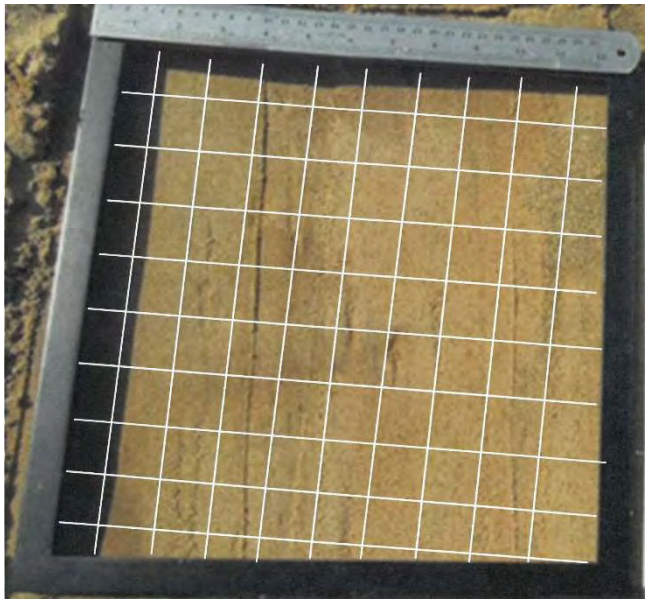
Following removal of the usable coal from the site, the excavation contractors will remove the underlying layer of coal soil mixture. Using the available information from boring logs within the coal yard, the excavation contractor will determine the approximate elevations for the lower limits of the coal layer. The coal removal goal will be to over-excavate approximately 6" of soil/fill material below the lower limit of the coal layer.

Verification documentation

Removal of the coal soil mixture will be documented by surveys of the area before and after removal using GPS methods to determine location and elevation. Each survey will be completed on the verification grid described in later paragraphs. Survey data will be tabulated and a topographic map of each surface will be generated as evidence of the removal. The survey grid will be supplemented if necessary to document grade changes and other irregularities.

HBPW intends to utilize a visual verification method to demonstrate consistency with a *de minimus* goal of an approximate 5% coal / 95% soil by area.

Documentation to provide verification of the visual determination methodology will consist of collecting photographs of the underlying soil after removal of the coal from the coal yard. Photos will be taken depicting the general conditions of the overall coal yard area; both before and after photos of the area will be included. Aerial photos of the area may be used as part of this documentation.



In addition, close up photo documentation of "gridded areas" taken from a standard height (using a monopod or tripod) of a 1'x1'square wooden grid frame containing scaled grid markings depicting 100

sub-grid squares. It is anticipated that a grid frame will be constructed similar to the example depicted in the adjacent photo. The grid frame will assist in providing a visual assessment that residual coal does not exceed more than 5% of the area within the grid frame. A systematic numbering process will be used on each photo correlating with a site map showing the approximate grid locations where the photos were taken.

Utilizing information contained in the MDEQ's Sampling Strategies and Statistics Training Materials (S3TM) guidance manual, due to the irregular shaped dimensions, calculations result in an approximate grid spacing ranging from 35 to 38 feet for the area of the former coal yard, depicted on Exhibit V-001, Existing Conditions July 2017. To facilitate laying out the grid spacing on site, a grid interval of approximately 33.33 feet will be used. This will result in a preliminary grid pattern having approximately 250 grid intersections within the former coal yard area as depicted on Figure 1; the total number may change depending on configuation of the grid pattern in the field. Close up photo documentation, as described above using the grid frame, will be taken at half of the grid intersections.

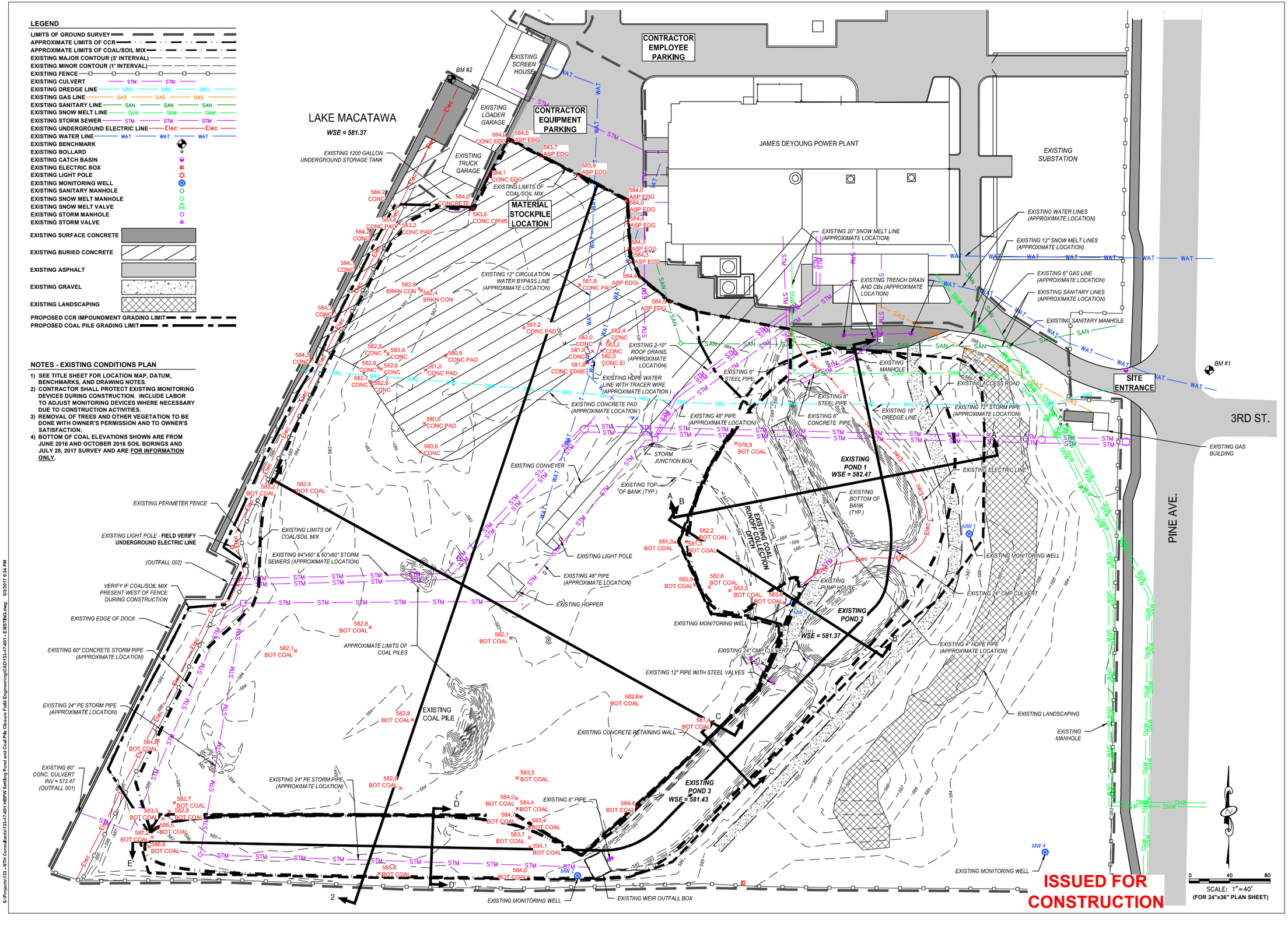
It is not anticipated that the subsurface layer of coal soil mixture will interface with the shallow groundwater table in many locations. However, If there are areas where the contractor encounters groundwater or areas where storm water collects during excavation activity, the water will be pumped to the adjacent settling ponds using trash pumps to allow for excavation to continue. Photo documentaion and survey elevations will be collected as soon as material is removed from these areas.

LEGEND

- LIMITS OF GROUND SURVEY
- APPROXIMATE LIMITS OF CCR
- APPROXIMATE LIMITS OF COAL/SOIL MIX
- EXISTING MAJOR CONTOUR (5' INTERVAL)
- EXISTING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM
- EXISTING DREDGE LINE — DRG
- EXISTING GAS LINE — GAS
- EXISTING SANITARY LINE — SAN
- EXISTING SNOW MELT LINE — SNW
- EXISTING STORM SEWER — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec
- EXISTING WATER LINE — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING BURIED CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- PROPOSED CCR IMPOUNDMENT GRADING LIMIT
- PROPOSED COAL PILE GRADING LIMIT

NOTES - EXISTING CONDITIONS PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.
3) REMOVAL OF TREES AND OTHER VEGETATION TO BE DONE WITH OWNER'S PERMISSION AND TO OWNER'S SATISFACTION.
4) BOTTOM OF COAL ELEVATIONS SHOWN ARE FROM JUNE 2016 AND OCTOBER 2016 SOIL BORINGS AND JULY 28, 2017 SURVEY AND ARE FOR INFORMATION ONLY.



S:\Projects\133 - NTH Consultants\133-17-001 HBPW Settling Pond and Coal Pile Closure Field Engineering\CAD\133-17-001 - EXISTING.dwg 8/2/2017 5:34 PM

Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B, Holland, Michigan 49424
Phone/Fax: (616) 994-6541
www.gvEESolutions.com

COAL PILE AND CCR SURFACE IMPOUNDMENT SYSTEM CLOSURES
HOLLAND BOARD OF PUBLIC WORKS
SECTION 30 T. 5 N., R. 15 W., CITY OF HOLLAND, OTTAWA COUNTY
JAMES DEYOUNG POWER PLANT
HOLLAND, MICHIGAN

MARK	DATE	DESCRIPTION
	09-22-2017	ISSUED FOR CONSTRUCTION
	04-17-2017	ISSUED FOR BID
	03-22-2017	ISSUED FOR 90% REVIEW MEETING
	02-09-2017	ISSUED FOR OWNER REVIEW
	01-24-2017	ISSUED FOR OWNER REVIEW
	01-17-2017	ISSUED FOR INTERNAL REVIEW

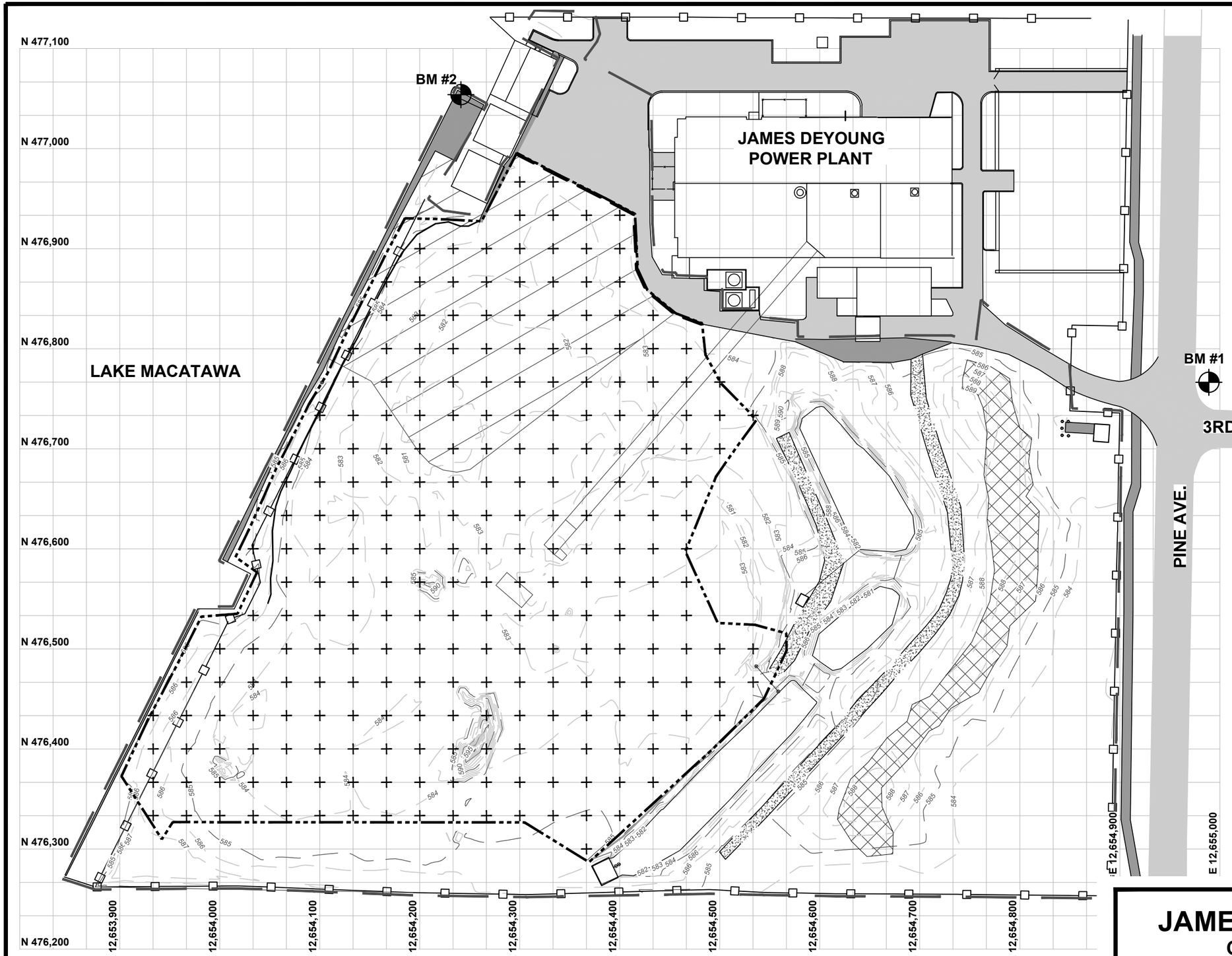
DESIGNED BY:	DS
DRAWN BY:	AM
CHECKED BY:	BL
PROJECT NO:	133-17-001

SHEET TITLE

EXISTING CONDITIONS JULY 2017

SHEET 2 OF 7

V-001



LEGEND

- APPROXIMATE LIMITS OF COAL/SOIL MIX
- BEGINNING MAJOR CONTOUR (5' INTERVAL)
- BEGINNING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING BENCHMARK
- EXISTING SURFACE CONCRETE
- EXISTING BURIED CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- GRID NODE +

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. EXISTING CONTOURS SHOWN ARE FROM THE JULY 28, 2017 SURVEY.
4. UTILITIES ARE NOT SHOWN FOR CLARITY

N

DRAFT

JAMES DEYOUNG POWER PLANT

COAL REMOVAL DOCUMENTATION - GRID NODES

SCALE	1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET			1	

Brad Venman

From: Unseld, Timothy (DEQ) <UNSELDT@michigan.gov>
Sent: Thursday, August 10, 2017 4:12 PM
To: Brad Venman; Roskoskey, Duane (DEQ); Sellers, Fred (DEQ); Walters, Kent (DEQ)
Cc: Radakovitz, Mike; Siler, Ted; Monroe, Jane; blaine.litteral@goeesolutions.net; Visscher, Judy
Subject: RE: Holland BPW - James De Young coal yard remediation project

Brad and Judy,

The Coal Yard Closure Plan – Coal Removal Visual Documentation Procedure, Revision 1 – August 10, 2017 received today is approved.

Please let me (and/or Kent) know if you need further assistance during this project.

From: Brad Venman [mailto:BVenman@nthconsultants.com]
Sent: Thursday, August 10, 2017 3:14 PM
To: Unseld, Timothy (DEQ) <UNSELDT@michigan.gov>; Roskoskey, Duane (DEQ) <ROSKOSKEYD@michigan.gov>; Sellers, Fred (DEQ) <SELLERSF@michigan.gov>; Walters, Kent (DEQ) <WaltersK7@michigan.gov>
Cc: Radakovitz, Mike <mradakovitz@hollandbpw.com>; Siler, Ted <tsiler@hollandbpw.com>; Monroe, Jane <jmonroe@hollandbpw.com>; blaine.litteral@goeesolutions.net; Visscher, Judy <jvisscher@hollandbpw.com>
Subject: RE: Holland BPW - James De Young coal yard remediation project

Tim,
The attached version incorporates the modifications we've made addressing your comments.

Thanks for your help.

Regards,

Brad

Brad Venman
NTH Consultants, Ltd.
(517) 702-2956 (direct)
(517) 881-0335 (cell)

From: Unseld, Timothy (DEQ) [mailto:UNSELDT@michigan.gov]
Sent: Wednesday, August 9, 2017 3:03 PM
To: Brad Venman <BVenman@nthconsultants.com>; Roskoskey, Duane (DEQ) <ROSKOSKEYD@michigan.gov>; Sellers, Fred (DEQ) <SELLERSF@michigan.gov>; Walters, Kent (DEQ) <WaltersK7@michigan.gov>
Cc: Radakovitz, Mike <mradakovitz@hollandbpw.com>; Siler, Ted <tsiler@hollandbpw.com>; Monroe, Jane

<jmonroe@hollandbpw.com>; blaine.litteral@goeesolutions.net; Visscher, Judy <jvisscher@hollandbpw.com>
Subject: RE: Holland BPW - James De Young coal yard remediation project

Brad,

We have a few very minor comments on the verification plan.

1. Please ensure that you take plenty of photos of the overall area giving a perspective on how it looks. Before and after may also be valuable. Judy did say you were planning a drone to capture an overview of the entire area. I think this would be very helpful.
2. You should propose documentation of elevations at points along the gridded area. These elevations should be compared to elevations where coal was encountered in the borings and also during coal removal activities which are currently underway. A surface map and a grid table comparing elevations (final vs. coal/soil contact) would be very helpful to document/prove removal (elevation being a second line of evidence).
3. You should plan on how you will photo document close-ups of grid points that may be at the water table or slightly below the water table.

From: Brad Venman [mailto:BVenman@nthconsultants.com]
Sent: Friday, August 04, 2017 2:40 PM
To: Unseld, Timothy (DEQ) <UNSELDT@michigan.gov>; Roskoskey, Duane (DEQ) <ROSKOSKEYD@michigan.gov>; Sellers, Fred (DEQ) <SELLERSF@michigan.gov>
Cc: Radakovitz, Mike <mradakovitz@hollandbpw.com>; Siler, Ted <tsiler@hollandbpw.com>; Monroe, Jane <jmonroe@hollandbpw.com>; blaine.litteral@goeesolutions.net; Visscher, Judy <jvisscher@hollandbpw.com>
Subject: RE: Holland BPW - James De Young coal yard remediation project

Good afternoon Tim,

Consistent with the things we discussed on Tuesday, we have developed a Conceptual Coal Removal Visual Documentation Procedure for your review and comment. Copies of the draft procedure and the referenced figures are attached.

We look forward to working with you as we proceed with the project.

Regards,

Brad Venman
NTH Consultants, Ltd.
517.702.2956
517.881.0335

From: Visscher, Judy [mailto:jvisscher@hollandbpw.com]
Sent: Tuesday, August 1, 2017 5:16 PM
To: unseldt@michigan.gov; roskoskeyd@michigan.gov; Sellers, Fred (DEQ) (SELLERSF@michigan.gov) <SELLERSF@michigan.gov>
Cc: Brad Venman <BVenman@nthconsultants.com>; Radakovitz, Mike <mradakovitz@hollandbpw.com>; Siler, Ted <tsiler@hollandbpw.com>; Monroe, Jane <jmonroe@hollandbpw.com>; blaine.litteral@goeesolutions.net
Subject: Holland BPW - James De Young coal yard remediation project
Importance: High

Thank you for the recent phone discussion regarding the James De Young Generating Facility coal yard remediation.

We agree to the following:

1. 5% de minimus coal left on site in the former coal yard will constitute “clean closure”
2. Verification of this de minimus amount will be by visual methods (*verification plan to be submitted to MDEQ shortly by Brad Venman of NTH consultants*)
3. Coal/soil mixture from the former coal yard will be disposed of in the HBPW Zeeland Township Landfill
4. The Perpetual Care Fund (PCF) for the HBPW Zeeland Township Landfill will be funded an additional $3254 (*to make up for the error of being previously classified as segregated*)
5. The coal/soil mixture that will be placed in the HBPW Zeeland Township Landfill will be charged at $0.75/ton instead of $0.075/ton (*same reason as in #4*)

We understand that our agreement on the points listed above will release a letter from the MDEQ authorizing the 5% de minimus, enabling Holland BPW to proceed with the coal yard remediation project, which is scheduled to begin August 7.

This letter from the MDEQ should be sent via email to my attention.

If there are any questions on the above, please contact me.

Regards,

Judy N. Visscher
Environmental Regulatory Specialist

Holland Board of Public Works
625 Hastings Avenue, Holland, MI 49423-5427

jvisscher@hollandbpw.com
office: 616-355-1210 cell: 616-405-0213

April 23, 2018

Mr. Timothy Unseld
Michigan Department of Environmental Quality
Waste Management and Radiological Protection Division
Grand Rapids District
State Office Building, 5th Floor
350 Ottawa Ave. NW
Grand Rapids, MI 49503-2341

RE: CCR Removal Documentation
Holland Board of Public Works, James DeYoung Power Plant

Dear Mr. Unseld:

The Holland Board of Public Works (Holland BPW) is submitting the final version of procedures developed for CCR Removal Documentation prepared for use at the James DeYoung Power Plant property. Consistent with your Email of April 18th, 2018, we are requesting formal approval of these procedures for removal of CCR materials that are regulated as a solid waste under Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, PA 451, as amended.

A final copy of the procedure you have reviewed including the referenced figures is enclosed.

Thank you for your ongoing assistance to Holland BPW in completing the closure of the former coal yard and ash impoundments for the James DeYoung Power Plant.

Sincerely,

Judy N. Visscher
Environmental Regulatory Specialist

cc: Jane Monroe, Holland BPW
Mike Radakovitz, Holland BPW
Joel Davenport, Holland BPW
Brad Venman, NTH
Blaine Litteral, E&ES

Enclosure

CCR Surface Impoundment – Supplemental CCR Removal Documentation Procedure
April 10, 2018 Final

Ash removal goals

As discussed in the Coal Combustion Residuals (CCR) Surface Impoundment System Closure Plan, Holland Board of Public Works (BPW) intends to close the CCR surface impoundments by removing CCR and decontaminating areas affected by potential releases from the CCR units.

Once the excavation contractors have begun work on-site, one of the initial steps will be to install and operate well points to dewater and lower the groundwater in the vicinity of the former impoundments in order to allow for removal of the visible CCR from the former impoundments and surrounding areas. Based on historical information and available boring information, the anticipated boundary for excavation of CCR materials is shown on Figure C-101 – Removal and Excavation Plan.

Following installation and operation of the dewatering system, the excavation contractors will remove the visible CCR and the underlying CCR/soil mixtures. The available information from boring logs within the areas of the ash impoundments will be used by the excavation contractor to help determine the approximate elevations for the lower limits of the CCR materials. The CCR removal goal will be to over-excavate approximately 6" of soil/fill material below the lower limit of the visible CCR into the underlying native soils.

Verification documentation

The **first line of evidence** documenting removal of the CCR/soil mixture will be surveys of the area before and after removal using GPS methods to determine location and elevation. Survey elevations will be completed on the grid nodes described in later paragraphs. Survey data documenting CCR removal will be tabulated and topographic maps will be generated.

HBPW intends to utilize a **second line of evidence** that includes a visual verification method to demonstrate consistency with a *de minimus* goal of an approximate 5% CCR / 95% soil by area.

Utilizing information contained in the MDEQ's Sampling Strategies and Statistics Training Materials (S3TM) guidance manual, due to the irregular shaped dimensions, calculations result in an approximate grid spacing ranging from 35 to 38 feet for the area of the CCR excavation area, depicted on Figure 1A. To facilitate laying out the grid spacing on site, a grid interval of approximately 33.33 feet will be used. This results in a preliminary grid pattern having approximately 181 grid nodes within the CCR excavation areas as depicted on Figure 1A. The total number of grid nodes may change depending on the actual excavation limits in the field. Close up photo documentation, as described below using the one-foot square frame, will be taken at half of the grid nodes.

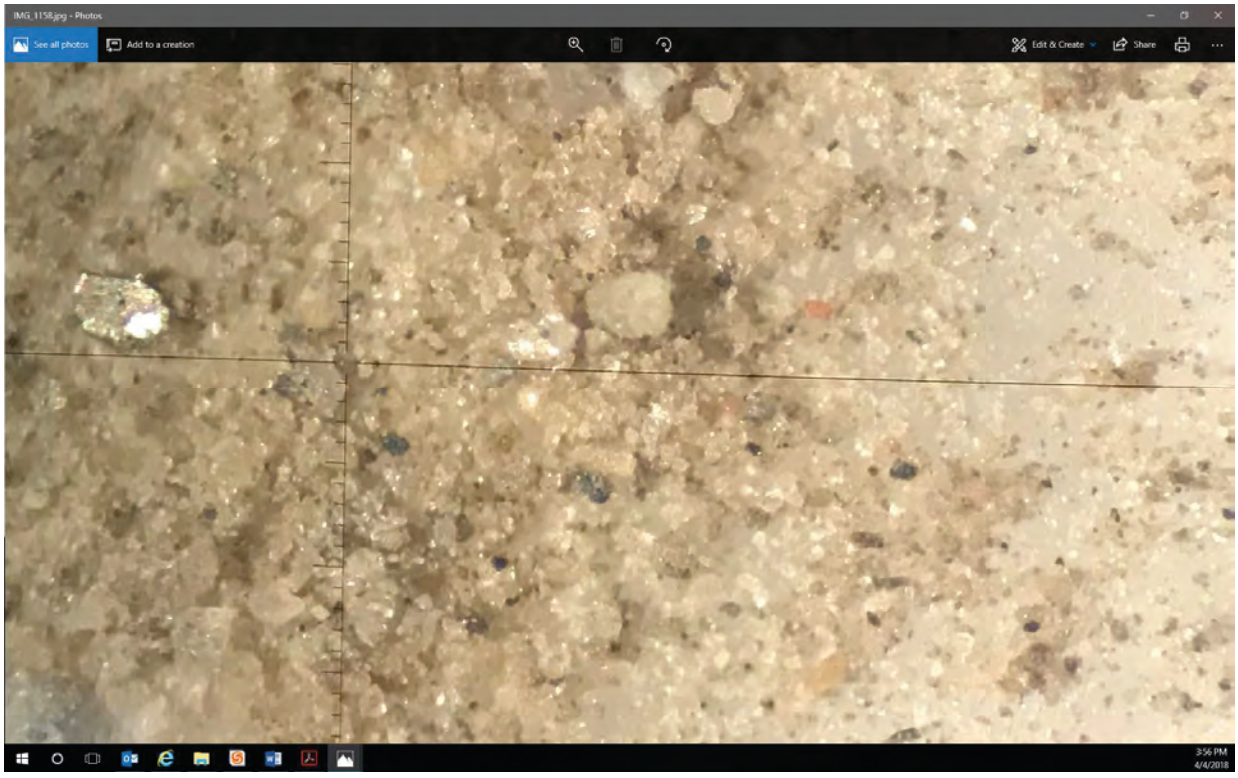
Documentation to provide verification of the visual determination methodology will consist of collecting photographs of the underlying soil after removal of the CCR material. Where sufficient color contrast is available between the subsoil underlying the area where dark gray to black colored ash has been removed, close up photo documentation at the randomly selected grid nodes will be taken from a standard height (using a monopod or tripod) of a 1'x1'square wooden frame. A grid frame similar to what is depicted in the adjacent photo will be used. Where the color contrast between the CCR and the underlying soil is sufficent, the grid frame will assist in providing a visual assessment that CCR does not exceed more than 5% of the area within the grid frame. The systematic numbering process as shown on Figure 1A will be used on each photo correlating with the approximate grid nodes where the photos will be taken.

In some cases, the color contrast between the dark gray to black colored ash and the underlying native subsoil may be insufficient to photographically document a difference. Where the visual inspection does not offer significant contrast between the dark gray to black ash residuals and the underlying soil, a **supplemental line of evidence** may include an examination for the presence of thin dark gray to black organic laminations and/or the presence of peat layers in the underlying native soil. Where appropriate, this step may be taken in the field to further evaluate and confirm natural silty materials. After collecting the grid photograph, a flat spade shovel may be used to remove a cube of soil to show the soil profile of the underlying native soils. Where this line of evidence is used, a photograph of the soil profile will be taken to document the observations of organic laminations/layers. The presence of undisturbed lamination and peat layers would indicate that the underlying soil is native soil and no ash would be present in the soil as the native soil was deposited prior to ash being deposited based on the law of superposition. However, it should be noted that in some locations, the underlying native soils consist of more clayey or sandy layers and these may not exhibit the same depositional laminations. In these cases, grain size and texture will be the main indicators of natural soils. To help document this information, we may collect a soil sample of the native soil in zip-lock bags to be stored temporarily (for up to approximately a year) to provide information to supplement the field observations/documentation.

A **third line of evidence** will be to collect verification soil samples from 25% of the grid nodes (these locations will be consistent with a portion of the grid nodes randomly selected for close-up photographic documentation). The number of the grid nodes collected for laboratory analysis total approximately 45 sample locations. The samples will be analyzed for residual concentrations of indicator parameters typically found in CCR materials. As has been discussed, the verification samples will be analyzed for total concentrations of the following parameters and the analytical results will be compared to Michigan's Part 201 cleanup criteria for soil:

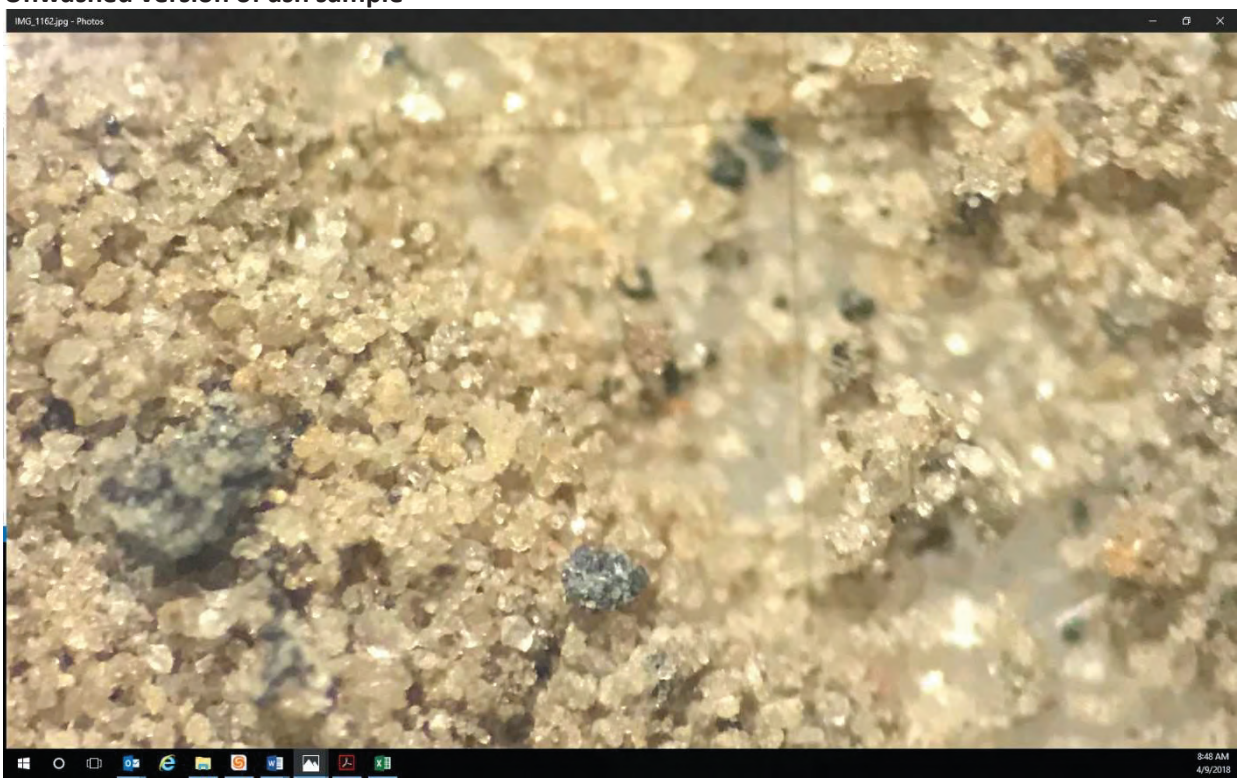
Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

A **fourth line of evidence** to help distinguish the presence of trace amounts of residual ash at select locations where the color contrast between the residual ash and the underlying soils is poor may include a microscopy evaluation. We have examined dried samples of soil using a stereomicroscope at approximately 40 times magnification. As depicted in the example photos below, this methodology appears to be provide a reasonable contrast between particles of ash and native soil particles. This technique may be used at locations where analytical samples are not collected and the visual contrast is insufficient to distinguish between the native soils.

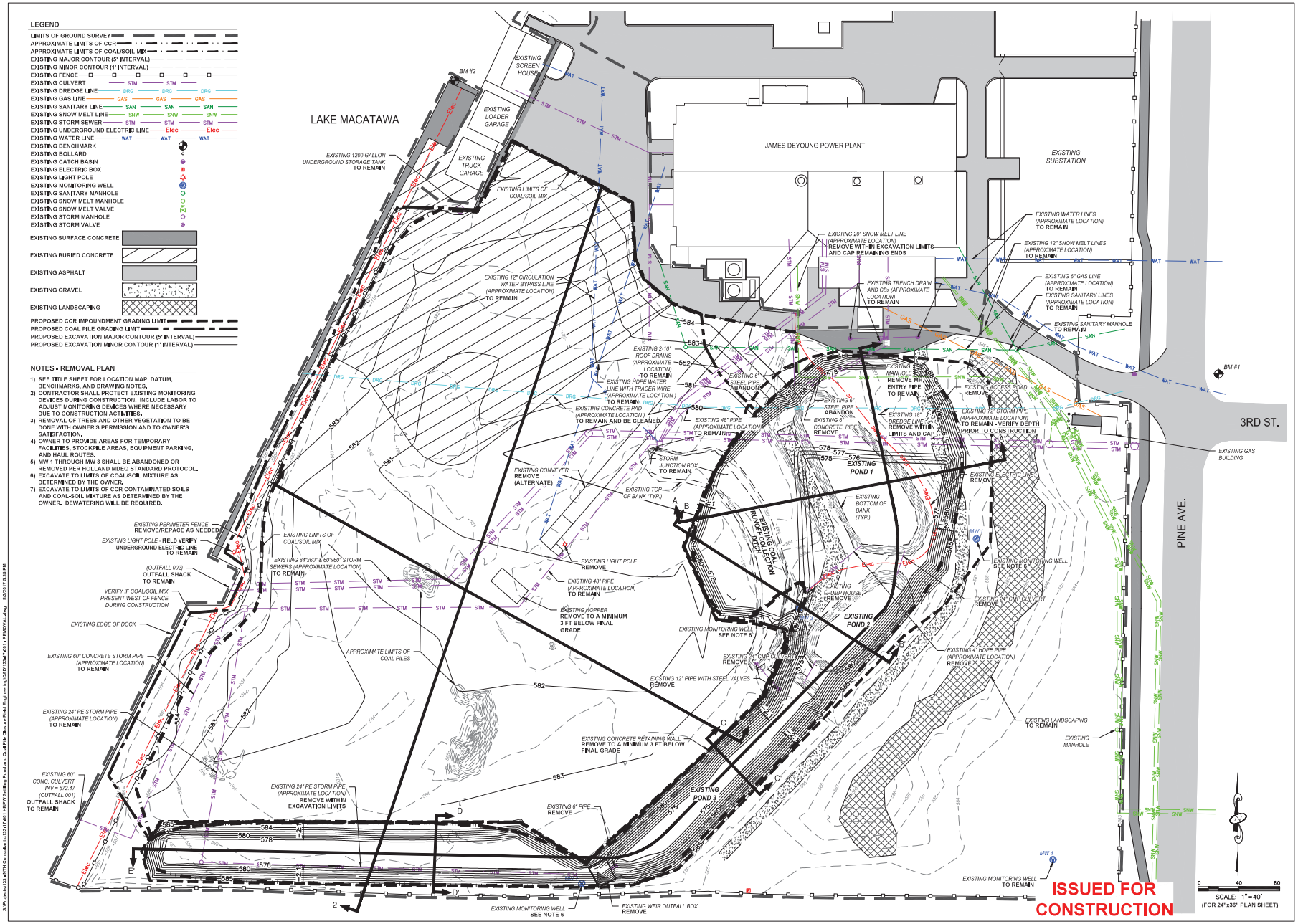


Unwashed version of silty sand sample

Unwashed version of ash sample



Unwashed version of approximately 95 silty sand and 5% ash sample



Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 140, Suite B, Holland, Michigan 49424
Phone/Fax: (616) 994-6241
www.goEESolutions.com

COAL PILE AND CCR SURFACE IMPOUNDMENT SYSTEM CLOSURES
HOLLAND BOARD OF PUBLIC WORKS
SECTION 30 T.5 N., R.16 W., CITY OF HOLLAND, OTTAWA COUNTY
JAMES DEYOUNG POWER PLANT
HOLLAND, MICHIGAN

MARK	DATE	DESCRIPTION
	09-05-2017	ISSUED FOR CONSTRUCTION
	04-17-2017	ISSUED FOR BID
	03-31-2017	ISSUED FOR PUBLIC REVIEW MEETING
	03-29-2017	ISSUED FOR OWNER REVIEW
	01-13-2017	ISSUED FOR OWNER REVIEW
	01-11-2017	ISSUED FOR INTERNAL REVIEW

DESIGNED BY: DS
DRAWN BY: AS
CHECKED BY: BL
PROJECT NO: 133-17-001

SHEET TITLE
REMOVAL & EXCAVATION PLAN

SHEET 4 OF 7
C-101

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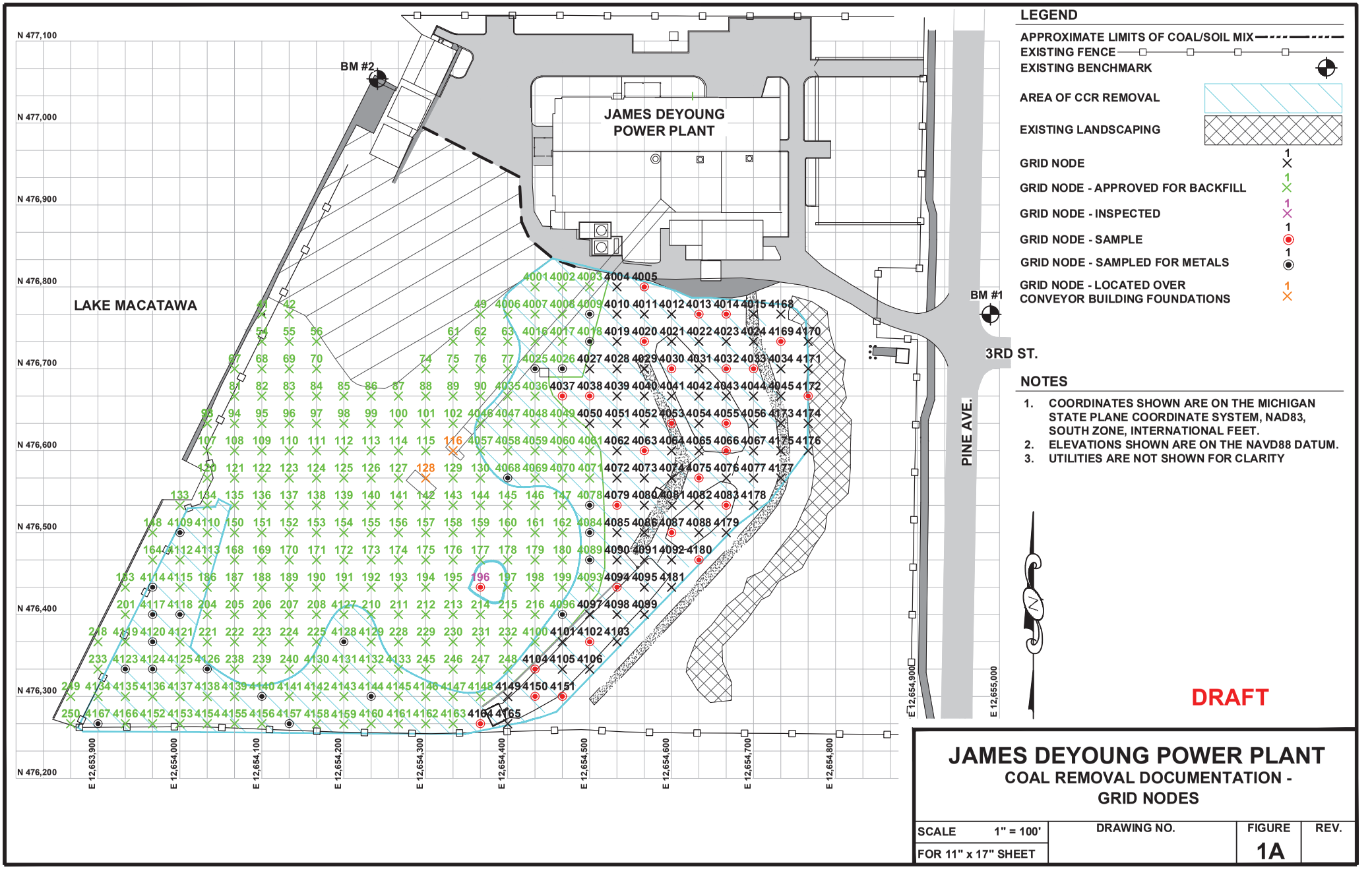


JAMES DEYOUNG POWER PLANT

COAL REMOVAL DOCUMENTATION - GRID NODES

SCALE 1" = 100'	DRAWING NO.	FIGURE	REV.
FOR 11" x 17" SHEET		1A	

APPENDIX F

AS-CONSTRUCTED DRAWINGS

G-001 TITLE SHEET

V-001 EXISTING CONDITIONS JULY 2017

C-101 REMOVAL RECORD

C-102 FINAL GRADING RECORD

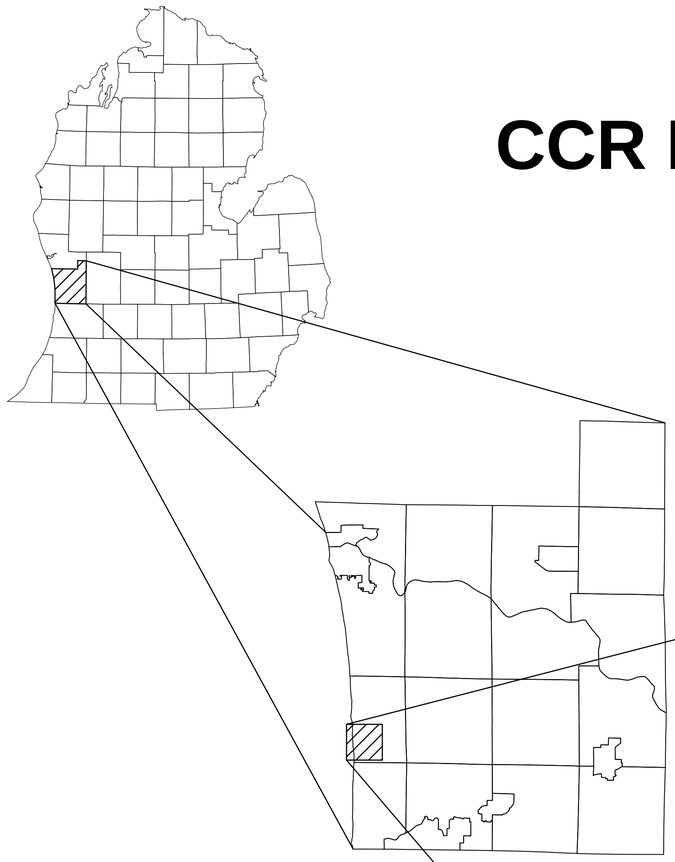
C-501 CCR AREA

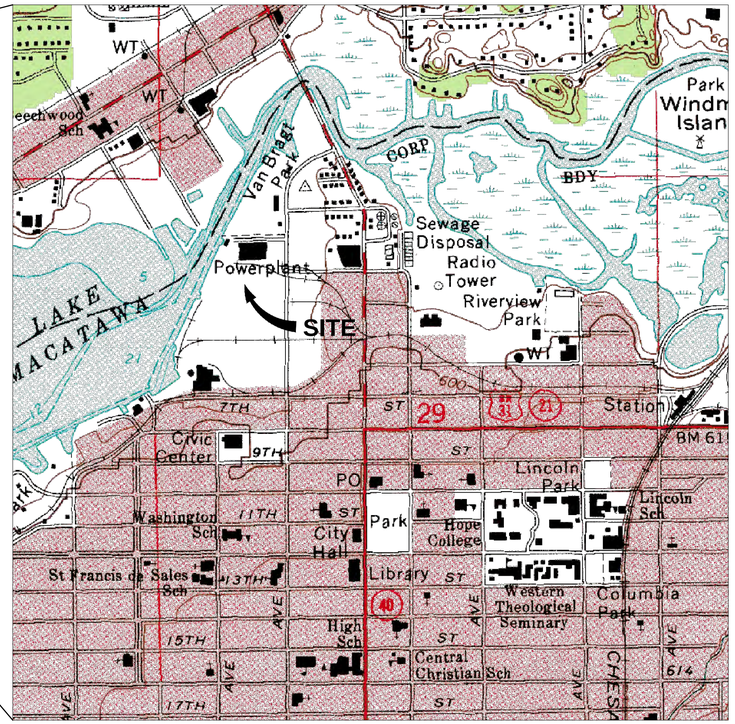
CCR IMPOUNDMENT SYSTEM CLOSUR

HOLLAND BOARD OF PUBLIC WORKS
JAMES DEYOUNG POWER PLANT

PREPARED BY:
Engineering & Environmental Solutions, LLC
PROJECT NO: 133-17-001

AUGUST 2018





64 PINE AVE, HOLLAND, MICHIGAN
SECTION 30 T. 5 N., R. 15 W.
CITY OF HOLLAND
OTTAWA COUNTY, MICHIGAN

SHEET INDEX

#	SHEET TIT
G-001	TITLE SHE
V-001	EXISTING C
C-101	REMOVAL
C-102	FINAL GRA
C-501	CCR AREA

DATUM AND BENC

DATUM: NAVD88, MI
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BENCHMARK 1: BO
N =
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BENCHMARK 2: CO
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DRAWING NOTES

1) EXISTING GROUN
AND JULY 28, 201
JULY 28, 2017.

2) SOIL BORINGS CO

3) CLEAN ELEVATIO
2017.

4) FINAL GRADING A
DECEMBER 7, 8, A
JUNE 1, 2018.

LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR (5' INTERVAL)
- EXISTING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM — STM
- EXISTING DREDGE LINE — DRG — DRG — DRG
- EXISTING GAS LINE — GAS — GAS — GAS
- EXISTING SANITARY LINE — SAN — SAN — SAN
- EXISTING SNOW MELT LINE — SNW — SNW — SNW
- EXISTING STORM SEWER — STM — STM — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec — Elec
- EXISTING WATER LINE — WAT — WAT — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING

NOTES - EXISTING CONDITIONS PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.
3) REMOVAL OF TREES AND OTHER VEGETATION TO BE DONE WITH OWNER'S PERMISSION AND TO OWNER'S SATISFACTION.
4) BOTTOM OF COAL ELEVATIONS SHOWN ARE FROM JUNE 2016 AND OCTOBER 2016 SOIL BORINGS AND JULY 28, 2017 SURVEY AND ARE FOR INFORMATION ONLY.

LAKE MACATAWA
WSE = 581.37

JAMES DEYOUNG POWER PLANT

EXISTING POND 1
WSE = 582.47

EXISTING POND 2
WSE = 581.37

EXISTING POND 3
WSE = 581.43

EXISTING COAL PILE

EXISTING COAL RUNOFF COLLECTION DITCH

BM #2

EXISTING SCREEN HOUSE

EXISTING LOADER GARAGE

EXISTING TRUCK GARAGE

EXISTING 1200 GALLON UNDERGROUND STORAGE TANK

EXISTING LIMITS OF COAL/SOIL MIX

EXISTING 12" CIRCULATION WATER BYPASS LINE (APPROXIMATE LOCATION)

EXISTING 20" SNOW MELT LINE (APPROXIMATE LOCATION)

EXISTING TRENCH DRAIN AND CBs (APPROXIMATE LOCATION)

EXISTING 2-10" ROOF DRAINS (APPROXIMATE LOCATION)

EXISTING 6" STEEL PIPE

EXISTING HDPE WATER LINE WITH TRACER WIRE (APPROXIMATE LOCATION)

EXISTING CONCRETE PAD (APPROXIMATE LOCATION)

EXISTING 48" PIPE (APPROXIMATE LOCATION)

EXISTING 6" CONCRETE PIPE

EXISTING 18" DREDGE LINE

EXISTING 72" STORM PIPE (APPROXIMATE LOCATION)

EXISTING ACCESS ROAD

EXISTING MANHOLE

STORM JUNCTION BOX

EXISTING CONVEYER

EXISTING TOP OF BANK (TYP.)

EXISTING BOTTOM OF BANK (TYP.)

EXISTING LIGHT POLE

EXISTING HOPPER

EXISTING PUMP HOUSE

EXISTING ELECTRIC LINE

EXISTING MONITORING WELL

EXISTING 24" CMP CULVERT

EXISTING 4" HDPE PIPE (APPROXIMATE LOCATION)

EXISTING 12" PIPE WITH STEEL VALVES

EXISTING CONCRETE RETAINING WALL

EXISTING WEIR OUTFALL BOX

EXISTING PERIMETER FENCE

EXISTING EDGE OF DOCK

EXISTING 84"x60" & 60"x60" STORM SEWERS (APPROXIMATE LOCATION)

APPROXIMATE LIMITS OF COAL PILES

VERIFY IF COAL/SOIL MIX PRESENT WEST OF FENCE DURING CONSTRUCTION

(OUTFALL 002)

EXISTING 60" CONCRETE STORM PIPE (APPROXIMATE LOCATION)

EXISTING 24" PE STORM PIPE (APPROXIMATE LOCATION)

EXISTING 60" CONC. CULVERT INV ≈ 572.47 (OUTFALL 001)

MW 1 MW 2 MW 3

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LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR (5' INTERVAL)
- EXISTING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM — STM
- EXISTING DREDGE LINE — DRG — DRG — DRG
- EXISTING GAS LINE — GAS — GAS — GAS
- EXISTING SANITARY LINE — SAN — SAN — SAN
- EXISTING SNOW MELT LINE — SNW — SNW — SNW
- EXISTING STORM SEWER — STM — STM — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec — Elec
- EXISTING WATER LINE — WAT — WAT — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- CCR IMPOUNDMENT GRADING LIMIT
- EXCAVATION MAJOR CONTOUR (5' INTERVAL)
- EXCAVATION MINOR CONTOUR (1' INTERVAL)

NOTES - REMOVAL PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.
3) REMOVAL OF TREES AND OTHER VEGETATION TO BE DONE WITH OWNER'S PERMISSION AND TO OWNER'S SATISFACTION.
4) OWNER TO PROVIDE AREAS FOR TEMPORARY FACILITIES, STOCKPILE AREAS, EQUIPMENT PARKING, AND HAUL ROUTES.
5) MW 1 THROUGH MW 3 SHALL BE ABANDONED OR REMOVED PER HOLLAND MDEQ STANDARD PROTOCOL.
6) EXCAVATE TO LIMITS OF COAL/SOIL MIXTURE AS DETERMINED BY THE OWNER.
7) EXCAVATE TO LIMITS OF CCR CONTAMINATED SOILS AND COAL-SOIL MIXTURE AS DETERMINED BY THE OWNER. DEWATERING WILL BE REQUIRED.

LAKE MACATAWA

JAMES DEYOUNG POWER PLANT

EXISTING SCREEN HOUSE

EXISTING LOADER GARAGE

EXISTING TRUCK GARAGE

BM #2

ASH HANDLING AREA

EXISTING 12" CIRCULATION WATER BYPASS LINE (APPROXIMATE LOCATION) TO REMAIN

EXISTING 20" SNOW MELT LINE (APPROXIMATE LOCATION) REMOVED/ **REMOVE WITHIN EXCAVATION LIMITS AND CAP REMAINING ENDS**

EXISTING TRENCH DRAIN AND CBs (APPROXIMATE LOCATION) TO REMAIN

EXISTING 2-10" ROOF DRAINS (APPROXIMATE LOCATION) TO REMAIN

EXISTING 6" STEEL PIPE ABANDON ABANDONED

EXISTING MANHOLE **REMOVE MH, ENTRY PIPE TO REMAIN**

EXISTING ACCESS ROAD REMOVE REMOVED

EXISTING 6" STEEL PIPE ABANDON ABANDONED

EXISTING 6" CONCRETE PIPE REMOVE REMOVED

EXISTING 18" DREDGE LINE **REMOVE WITHIN LIMITS AND CAP** LEFT IN PLACE

EXISTING 72" STORM PIPE (APPROXIMATE LOCATION) TO REMAIN - **VERIFY DEPTH PRIOR TO CONSTRUCTION**

EXISTING 48" PIPE (APPROXIMATE LOCATION) TO REMAIN

STORM JUNCTION BOX 577 TO REMAIN

EXISTING TOP OF BANK (TYP.)

EXISTING BOTTOM OF BANK (TYP.)

EXISTING POND 1

EXISTING 48" PIPE (APPROXIMATE LOCATION) TO REMAIN

EXISTING COAL RUNOFF COLLECTION DITCH

EXISTING ELECTRIC LINE REMOVE REMOVED

EXISTING MONITORING WELL SEE NOTE 5 REMOVED

EXISTING PUMP HOUSE REMOVE REMOVED

EXISTING 24" CMP CULVERT REMOVE REMOVED

EXISTING POND 2

EXISTING MONITORING WELL SEE NOTE 5 REMOVED

EXISTING 24" CMP CULVERT REMOVE REMOVED

EXISTING 4" HDPE PIPE (APPROXIMATE LOCATION) REMOVE REMOVED

EXISTING 12" PIPE WITH STEEL VALVES REMOVE REMOVED

EXISTING CONCRETE RETAINING WALL REMOVED **REMOVE TO A MINIMUM 3 FT BELOW FINAL GRADE**

EXISTING POND 3

EXISTING 6" PIPE REMOVE REMOVED

EXISTING MONITORING WELL SEE NOTE 5

EXISTING WEIR OUTFALL BOX REMOVE REMOVED

EXISTING MONITORING WELL TO REMAIN

ELECTRICAL CONDUIT REMOVED UP TO LIGHTPOLE

EXISTING PERIMETER FENCE REMOVED/REPLACED **REMOVE/REPACE AS NEEDED**

EXISTING LIGHT POLE - **FIELD VERIFY UNDERGROUND ELECTRIC LINE TO REMAIN** REMOVED

EXISTING EDGE OF DOCK

EXISTING 60" CONCRETE STORM PIPE (APPROXIMATE LOCATION) TO REMAIN

EXISTING 24" PE STORM PIPE (APPROXIMATE LOCATION) TO REMAIN REMOVED

ELECTRICAL CONDUIT INACTIVE, LEFT IN PLACE

EXISTING 60" CONC. CULVERT INV ≈ 572.47 (OUTFALL 001)

EXISTING 24" PE STORM PIPE (APPROXIMATE LOCATION) REMOVED **REMOVE WITHIN EXCAVATION LIMITS**

LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR AFTER EXC. (5' INTERVAL)
- EXISTING MINOR CONTOUR AFTER EXC. (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM
- EXISTING DREDGE LINE — DRG
- EXISTING GAS LINE — GAS
- EXISTING SANITARY LINE — SAN
- EXISTING SNOW MELT LINE — SNW
- EXISTING STORM SEWER — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec
- EXISTING WATER LINE — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- CCR IMPOUNDMENT GRADING LIMIT
- EXCAVATION MAJOR CONTOUR (5' INTERVAL)
- EXCAVATION MINOR CONTOUR (1' INTERVAL)
- GRID POINT
- GRID POINT - CCR SAMPLE LOCATION

NOTES - GRADING PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.

NEW WELL LOCATIONS AND ELEVATIONS

Well	Northing	Easting	Top of casing	Ground Elevation (Cement)
MW-1	476261.95	12654179.45	588.53	585.43
MW-2	476290.81	12653897.91	585.49	582.64
MW-3	476607.46	12654048.16	585.30	582.04

SEEDING/ MULCHING/ FERTILIZER
TOPSOIL — 4 INCH
SAND FILL — VARIES
EXISTING SOIL

BACKFILL SECTION
NOT TO SCALE

LAKE MACATAWA
BM #2
EXISTING SCREEN HOUSE
EXISTING LOADER GARAGE
EXISTING TRUCK GARAGE
JAMES DEYOUNG POWER PLANT
NEW MONITORING WELL MW-3
INLET INVERT ELEVATION 581.17
NEW MONITORING WELL MW-2
NEW MONITORING WELL MW-1
EXISTING LANDSCAPIN
EXISTING MONITORING WELL
MW

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Point Number	Northing	Easting	Original Elevation	Cleaned Elevation	Sand Elevation	Topsoil Elevation
196	476433.36	12654366.66	584.02	576.60	581.25	581.83
4001	476800.00	12654433.33	583.30	581.62	581.93	582.59
4002	476800.00	12654466.67	583.82	580.91	583.33	583.67
4003	476800.00	12654500.00	584.11	582.34	583.29	584.12
4004	476800.00	12654533.33	584.25	580.99	583.42	584.59
4005	476800.00	12654566.67	587.07	579.09	584.27	585.27
4006	476766.67	12654400.00	581.96	580.70	581.54	582.12
4007	476766.67	12654433.33	583.25	580.42	581.67	582.17
4008	476766.67	12654466.67	583.71	583.712	581.59	582.18
4009	476766.67	12654500.00	583.55	580.82	581.54	582.21
4010	476766.67	12654533.33	584.28	578.59	581.73	582.15
4011	476766.67	12654566.67	588.50	579.52	581.56	581.98
4012	476766.67	12654600.00	588.74	579.62	582.59	583.01
4013	476766.67	12654633.33	588.22	579.60	582.74	583.49
4014	476766.67	12654666.67	585.96	578.60	582.34	583.01
4015	476766.67	12654700.00	585.08	578.96	582.04	582.46
4016	476733.33	12654433.33	582.88	581.02	581.73	582.32
4017	476733.33	12654466.67	583.77	580.42	581.48	581.98
4018	476733.33	12654500.00	583.63	580.35	581.75	582.08
4019	476733.33	12654533.33	583.63	578.57	583.04	583.63
4020	476733.33	12654566.67	590.07	578.17	581.57	581.99
4021	476733.33	12654600.00	ND	579.264	581.82	582.15
4022	476733.33	12654633.33	588.58	571.081	581.81	582.22
4023	476733.33	12654666.67	586.22	578.90	581.75	582.17
4024	476733.33	12654700.00	585.24	579.50	581.86	582.19
4025	476700.00	12654433.33	583.52	579.71	581.88	582.21
4026	476700.00	12654466.67	583.30	579.79	581.81	582.14
4027	476700.00	12654500.00	582.57	577.92	582.07	582.57
4028	476700.00	12654533.33	582.54	579.27	581.46	581.96
4029	476700.00	12654566.67	588.60	572.29	581.48	581.82
4030	476700.00	12654600.00	ND	574.90	581.55	582.14
4031	476700.00	12654633.33	ND	578.32	581.51	582.18
4032	476700.00	12654666.67	588.60	579.93	581.76	582.10
4033	476700.00	12654700.00	585.14	579.30	581.93	582.35
4034	476700.00	12654733.33	585.91	578.83	581.85	582.18
4035	476666.67	12654400.00	583.26	579.44	581.48	581.82
4036	476666.66	12654433.29	581.55	581.06	581.52	582.02
4037	476666.67	12654466.67	581.13	576.63	581.56	582.06
4038	476666.67	12654500.00	581.35	576.59	581.54	582.04
4039	476666.67	12654533.33	582.38	579.29	581.52	581.94
4040	476666.67	12654566.67	583.11	575.22	581.67	582.09
4041	476666.67	12654600.00	584.75	574.94	581.49	581.91
4042	476666.67	12654633.33	ND	573.53	581.73	582.15
4043	476666.67	12654666.67	ND	574.25	581.34	582.09
4044	476666.67	12654700.00	588.21	577.30	581.80	582.13
4045	476666.67	12654733.33	585.52	579.24	581.95	582.28
4046	476633.33	12654366.67	583.46	580.10	581.42	581.76
4047	476633.33	12654399.82	582.09	580.55	581.61	582.02
4048	476633.40	12654433.35	582.17	580.15	581.52	581.93
4049	476633.33	12654466.67	582.21	579.23	581.49	581.91
4050	476633.33	12654500.00	582.92	575.54	581.53	582.03
4051	476633.33	12654533.33	581.11	575.76	581.53	581.86
4052	476633.33	12654566.67	582.74	579.17	581.44	581.94
4053	476633.33	12654600.00	588.41	579.06	581.47	581.97
4054	476633.33	12654633.33	ND	574.65	581.55	582.14
4055	476633.33	12654666.67	ND	573.20	581.37	581.95
4056	476633.33	12654700.00	586.20	574.94	581.70	582.03
4057	476600.07	12654366.66	582.30	580.11	581.20	581.78
4058	476600.03	12654400.06	582.29	580.22	581.28	581.87
4059	476600.00	12654433.29	582.40	581.06	581.35	581.85
4060	476600.00	12654466.67	582.67	579.33	581.35	581.85
4061	476600.00	12654500.00	583.09	579.44	581.56	581.89
4062	476600.00	12654533.33	580.96	579.13	581.67	582.09
4063	476600.00	12654566.67	585.06	579.21	581.47	581.81
4064	476600.00	12654600.00	586.82	579.10	581.39	581.97
4065	476600.00	12654633.33	586.49	579.94	581.42	582.00
4066	476600.00	12654666.67	ND	573.99	581.54	581.96
4067	476600.00	12654700.00	587.75	578.50	581.48	581.98

Point Number	Northing	Easting	Original Elevation	Cleaned Elevation	Sand Elevation	Topsoil Elevation
4068	476566.77	12654400.07	582.77	580.99	581.40	581.90
4069	476566.80	12654433.25	583.00	580.54	581.52	581.86
4070	476566.77	12654466.71	583.14	580.51	581.59	581.92
4071	476566.67	12654500.00	583.38	579.36	581.37	581.79
4072	476566.67	12654533.33	582.14	580.24	581.57	581.98
4073	476566.67	12654566.67	581.38	578.74	581.55	581.96
4074	476566.67	12654600.00	586.43	579.72	581.49	581.83
4075	476566.67	12654633.33	587.40	580.11	581.59	582.01
4076	476566.67	12654666.67	583.91	580.00	581.65	582.07
4077	476566.67	12654700.00	587.29	581.35	581.60	582.10
4078	476533.45	12654499.96	583.53	580.23	581.41	581.74
4079	476533.33	12654533.33	583.21	580.21	581.51	581.85
4080	476533.33	12654566.67	584.44	581.01	581.48	581.89
4081	476533.33	12654600.52	586.44	578.42	581.45	581.95
4082	476533.33	12654633.33	ND	576.46	581.30	581.80
4083	476533.33	12654666.67	ND	576.59	581.78	582.20
4084	476499.89	12654500.02	583.55	580.94	581.58	581.92
4085	476500.00	12654533.33	582.09	578.91	581.43	581.77
4086	476500.00	12654566.67	585.76	580.12	581.53	581.87
4087	476500.00	12654600.00	ND	578.96	581.44	581.86
4088	476500.00	12654633.33	ND	576.82	581.25	581.75
4089	476466.60	12654499.92	583.72	581.59	581.55	581.89
4090	476466.67	12654533.33	584.74	580.66	581.47	581.89
4091	476466.67	12654566.67	583.12	580.26	581.57	581.99
4092	476466.67	12654600.00	585.53	581.48	581.74	582.16
4093	476433.33	12654500.00	584.09	581.34	581.53	581.86
4094	476433.33	12654533.33	583.22	579.73	581.42	581.76
4095	476433.33	12654566.67	ND	570.05	581.08	581.67
4096	476400.00	12654466.67	584.04	580.45	581.48	581.98
4097	476400.00	12654500.00	582.98	579.39	581.14	581.56
4098	476400.00	12654533.33	ND	569.62	581.06	581.72
4099	476400.00	12654566.67	584.89	583.92	583.21	584.21
4100	476366.67	12654433.33	584.66	580.20	581.26	581.76
4101	476366.67	12654466.67	583.51	580.08	581.36	581.77
4102	476366.67	12654500.00	ND	573.50	581.41	581.74
4103	476366.67	12654533.33	584.81	583.32	583.12	583.70
4104	476333.33	12654433.33	583.11	580.01	581.29	581.70
4105	476333.33	12654466.67	ND	573.69	581.56	581.89
4106	476333.33	12654500.00	583.81	582.19	583.13	583.72
4109	476500.00	12654000.00	586.19	581.80	582.30	582.64
4110	476500.00	12654033.33	584.75	579.85	581.31	581.65
4112	476466.67	12654000.00	585.24	580.52	581.55	582.05
4113	476466.67	12654033.33	584.03	583.66	581.55	582.05
4114	476433.33	12653966.67	585.66	581.65	582.13	582.80
4115	476433.33	12654000.00	584.05	580.93	581.42	582.00
4117	476400.00	12653966.67	585.25	581.37	581.44	582.10
4118	476400.00	12654000.00	583.97	580.12	581.54	582.12
4119	476366.67	12653933.33	586.23	581.90	581.89	582.47
4120	476366.67	12653966.67	585.05	585.048	581.42	582.01
4121	476366.67	12654000.00	584.20	578.55	581.60	582.10
4123	476333.33	12653933.33	586.53	586.531	581.47	582.14
4124	476333.33	12653966.67	585.30	580.52	581.70	582.03
4125	476333.33	12654000.00	584.61	578.94	581.48	581.98
4126	476333.30	12654033.36	584.25	580.21	581.59	582.09
4127	476400.08	12654200.02	583.47	582.16	581.76	582.09
4128	476366.65	12654200.05	583.69	582.06	581.46	581.88
4129	476366.71	12654233.33	584.23	582.30	581.64	582.05
4130	476333.31	12654166.71	584.06	581.92	581.79	582.12
4131	476333.33	12654200.01	584.20	582.71	581.69	582.19
4132	476333.31	12654233.34	584.53	582.74	581.58	582.00
4133	476333.32	12654266.67	584.58	582.98	581.35	582.02
4134	476299.97	12653900.01	585.81	582.09	582.07	582.40
4135	476300.06	12653933.32	587.62	581.77	581.40	582.23
4136	476299.98	12653966.64	587.03	580.45	581.54	582.12
4137	476300.00	12654000.02	585.35	581.35	581.66	581.99
4138	476300.02	12654033.34	584.81	580.51	581.55	582.13
4139	476299.93	12654066.68	584.70	581.28	581.53	582.11
4140	476299.99	12654100.01	584.87	581.14	581.74	582.16

Point Number	Northing	Easting	Original Elevation	Cleaned Elevation	Sand Elevation	Top Ele
4141	476299.94	12654133.36	584.88	581.68	581.50	582
4142	476300.02	12654166.64	584.59	581.82	581.46	582
4143	476299.97	12654200.01	584.18	581.90	581.67	582
4144	476299.95	12654233.30	584.82	581.74	581.48	581
4145	476299.97	12654266.69	585.17	582.52	581.59	582
4146	476300.02	12654299.90	585.31	582.71	581.28	581
4147	476300.00	12654333.33	585.60	582.76	582.01	582
4148	476300.00	12654366.67	585.14	583.86	581.82	582
4149	476300.00	12654400.00	583.12	578.34	581.30	581
4150	476300.00	12654433.33	ND	574.24	581.58	581
4151	476300.00	12654466.67	583.19	579.36	583.44	584
4152	476266.62	12653966.63	586.22	582.17	583.93	584
4153	476266.68	12654000.00	586.48	582.24	584.06	584
4154	476266.64	12654033.30	586.76	582.13	584.52	584
4155	476266.63	12654066.67	586.86	581.39	585.30	585
4156	476266.66	12654100.03	586.97	581.55	585.51	585
4157	476266.68	12654133.33	587.06	581.79	585.42	585
4158	476266.40	12654166.65	586.87	581.97	584.50	585
4159	476266.17	12654200.01	586.71	582.43	583.57	584
4160	476266.64	12654233.33	586.59	582.18	583.13	583
4161	476266.61	12654266.72	586.17	582.17	582.71	583
4162	476267.01	12654299.95	585.93	583.49	583.12	583
4163	476266.67	12654333.33	585.98	584.11	584.03	584
4164	476266.67	12654366.67	586.23	582.66	583.68	584
4165	476266.67	12654400.00	586.42	581.97	583.27	583
4166	476266.67	12653933.33	585.94	580.80	583.61	583
4167	476266.67	12653900.00	585.64	581.83	583.83	584
4168	476766.67	12654733.33	588.04	580.28	581.74	582
4169	476733.33	12654733.33	587.41	579.90	581.78	582
4170	476733.33	12654766.67	589.13	580.39	581.71	582
4171	476700.00	12654766.67	588.24	579.60	581.70	582
4172	476666.67	12654766.67	587.12	579.10	581.72	582
4173	476633.33	12654733.33	585.70	580.43	581.69	582
4174	476633.33	12654766.67	587.51	578.60	581.62	582
4175	476600.00	12654733.33	585.93	580.90	581.53	581
4176	476600.00	12654766.67	588.06	581.10	581.87	582
4177	476566.67	12654733.33	586.05	581.20	581.62	582
4178	476533.33	12654700.00	586.96	584.65	582.73	583
4179	476500.00	12654666.67	585.48	584.76	583.37	584
4180	476466.67	12654633.33	586.03	583.47	583.96	584
4181	476433.33	12654600.00	584.81	583.561	583.71	584

ATTACHMENTS

A.1- A.4

A.1 - Coal Yard Closure Report

A.2 - CCR Impoundment Closure Report

A.3 - CCR Beneficial Use Documentation Report

A.4 –Addendum Rpt_Rev 2

James DeYoung Power Plant

Coal Combustion Residuals (CCR) Beneficial Use

Holland Board of Public Works

Holland, Michigan

NTH Project No. 73-160017-05

September 2018

NTH Consultants, Ltd.
608 S, Washington Avenue
Lansing, MI 48933

INTRODUCTION

This report documents the investigation and handling of Coal Combustion Residual (CCR) materials that were determined to have been used beneficially as a leveling/base layer in the construction of a former gravel parking/work area and also used for backfill for underground utility infrastructure on a portion of the site. These materials were discovered in an area to the east of the active CCR impoundments at the James DeYoung power plant owned by the Holland Board of Public Works (HBPW). The plant is located at 64 Pine Avenue in Holland, Michigan near the eastern end of Lake Macatawa.

A closure plan, prepared by NTH Consultants, Ltd. (NTH) dated October 17, 2016, outlined the steps that would be taken to close the active CCR impoundment and historic ash handling area. HBPW implemented clean closure of the CCR impoundments in accordance with Part 257 of Title 40, Protection of Environment, of the Code of Federal Regulations and the CCR impoundment closure is documented in a separate report. The area containing CCR materials that were used beneficially were discovered during excavation of CCR removal in the active CCR impoundment area.

The historic beneficially reused materials discovered at the site included an area where a soil and CCR mixture was used as backfill over existing hot water pipelines for the Holland snowmelt system and a leveling layer of CCR materials used below a former gravel parking/work pad area on the northeastern corner of the site. It was observed that the former parking/work pad area was constructed of a base layer of CCR material overlain in some areas by geotextile fabric and covered with gravel. These materials were discovered below what was a landscaped area consisting of un-impacted soil used for a visual screening berm and a topsoil covered lawn area.

HBPW determined that CCR materials that had been used for construction of the former gravel parking area would be removed. The limited area where CCR materials were used beneficially and left in place is in an area of the site containing snowmelt water pipelines and other sensitive infrastructure, including natural gas and sanitary sewer pipelines. Removal of the CCR materials in this area was determined to not be feasible due to the increased risk of potentially damaging the critical infrastructure.

The removal and documentation of activities pertaining to CCR materials used beneficially was conducted from May 2018 to June 2018. All site activities were completed in substantial conformance with standard construction practices, project specifications, and Part 115 of the Natural Resources Protection Act, 1994, PA 451, as amended (Part 115).

INVESTIGATION AND REMOVAL OF BENIFICIALLY REUSED CCR MATERIALS

Field personnel considered information noted on site construction plans (see construction drawings in Appendix D) when using an excavator to complete a series of test pits to delineate the area where beneficially reused CCR materials were discovered at the site. These test pits extended southward until the limits of the CCR leveling layer were documented. Several test pits were dug using hydro-vac equipment to locate the active snowmelt lines on the northern and eastern edge of this area to allow removal of as much beneficially reused material as possible without threatening the integrity of the lines and confirmed that the backfill over the pipelines in this portion of the site contained a soil/CCR mixture.

The CCR materials were removed from the area of the former parking/work pad area. It was decided not to excavate too closely to the working snowmelt lines to avoid the possibility of damage from the heavy equipment; CCR materials remain in the vicinity of the active snowmelt lines along the northeastern and eastern portion of the CCR removal grid. The estimated limit of the beneficially reused CCR material remaining on-site is shown on Figure C-102 in Appendix D. Although the snowmelt lines are disconnected from the James DeYoung Power Plant, the lines are connected to the HBPW's new power plant located at the Holland Energy Park, 1 Energy Park Way, Holland, MI 49423 and damage to the lines would adversely affect the plant and the City of Holland's snow melt system.

Verification Points 4202, 4203, 4205, 4207, 4208, and 4211 are located over these active snowmelt lines. The CCR materials underlying these points remain in place. A hand auger was used to bore down to a depth of three-feet at points 4208 and 4211 so that a jar sample could be evaluated for the presence of indicator parameters typically found in CCR materials. These results are included in Appendix C and provide documentation on the CCR material left in place along the snowmelt line utility easement. The sampling points and results of analytical testing for the excavated areas where the beneficially used CCR were removed are documented in the accompanying drawings and tables contained in Appendices B & C.

The excavation contractor (Ryan, Inc.) completed removal and assisted the Field CQA Engineer in completing investigation of the area where CCR materials had been used beneficially. The methods and progression of CCR material excavation are presented in the following paragraphs.

Excavation of the beneficially reused CCR material included removal of the CCR leveling layer found to the east of the former ash impoundment area and backfill over the inactive pipelines. Ryan, Inc. began by removing clean topsoil and soil backfill from the screening berm and lawn area. The removal began in the south portion of the area and proceeded north towards the James DeYoung Power Plant.

The CCR material was excavated by Ryan Inc. using a dozer, excavator and skidsteer. The excavated material was pushed using a dozer, or transferred using a loader and the skidsteer, to stockpiles located near the paved roads to await removal from the site. Care was taken to prevent the CCR materials from being mixed with overlying and underlying soils and to prevent tracking of material to unimpacted areas of the site.

Removal activities continued until natural soils were encountered and lab/field data collected by the Field CQA Engineer indicated that CCR removal verification matrices had been achieved. EES completed construction quality assurance activities throughout the project, including in this area. These activities were completed in a manner consistent with the procedures described in the CCR Removal report both to verify CCR materials had been successfully removed, as well as to document remaining beneficially reused CCR materials. Following removal of the excavated CCR materials, the site was restored to a smooth even grade capable of supporting vegetation.

Summary tables of analytical results with comparison to cleanup criteria and laboratory results are presented in Appendix C.

BENEFICIAL USE

SUMMARY DISCUSSION

CCR materials that are used in a manner that meet the definition of beneficial use of CCR are not subject to Subpart D – Standards for the Disposal of Coal Combustion Residuals in landfills and Surface Impoundments, see 40 CFR 257.50(g). According to the definition of "*Beneficial Use of CCR*" in 40 CFR 257.53, CCR materials that are used for beneficial use must satisfy the following criteria:

(1) The CCR must provide a functional benefit;

(2) The CCR must substitute for the use of a virgin material, conserving natural resources that would otherwise need to be obtained through practices such as extraction;

(3) The use of CCR must meet relevant product specifications, regulatory standards, or design standards when available, and when such standards are not available, CCR are not used in excess quantities.

Therefore, as the limited quantity of CCR material used as part of the utility backfill that remains in place meets the definition of beneficial use, it is not subject to the regulatory requirements of 40 CFR Part 257 or the closure activities for the CCR impoundments.

Analytical results from samples of the beneficially used ash indicate that while the total arsenic concentrations are slightly elevated (see Table 3 in Appendix C.3), they are below Part 201 non-residential cleanup criteria and are consistent within the range of concentrations that were found not to leach in excess of residential drinking water criteria. With respect to requirements of Part 115, as the historic beneficial use and placement in this location predated the current regulatory requirements for beneficial reuse of coal ash residuals, HBPW intends to maintain the soil cover over this area to limit exposure to the subsurface soils at the site and as part of the groundwater monitoring program, HBPW will demonstrate that the groundwater quality for the entire site satisfies the closure requirements of 40 CFR Part 257.

APPENDIX A

FIELD AND PHOTOGRAPH REPORTS

NOTE: WORK ON PORTIONS OF THE CCR IMPOUNDMENT AREA AND THE BENEFICIAL USE INVESTIGATION AREA ARE DOCUMENTED IN THE FIELD REPORTS AS THE WORK WAS PERFORMED CONCURRENTLY

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/10/2018

Project Number: 133-17-001

Time Arrived: 9:45 Time Left: 11:45 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 58 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Sand and topsoil continued to be delivered to the site today. A fourth lift of sand was placed on the north half of Pond 3 and Pond 2 as a whole. After density tests were taken and considered passing one operator via dozer placed topsoil on these verified areas and graded it. Ryan had the east wall of Pond 1 further excavated and found some ash outside of the current documentation grid limits. Rob would like Jane and Blaine to discuss whether to continue chasing the ash or to stop at the current limits.

Summary of CQA Activities

Site visit and observation of construction activities. Used the Troxler density gauage to take density recordings on the north portion of the fourth lift placed in Pond 3 - all three recordings passed. Took two additional density testings in Pond 2 on the third lift of sand - both passed as well.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/10/2018

Project Number: 133-17-001

General picture from today's site visit

Ash found outside of limits

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/11/2018

Project Number: 133-17-001

Time Arrived: 10:00 Time Left: 10:35 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 44 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan dug several test pits with the excavator earlier with Blaine present to determine if ash was present outside of the current CCR limits. CCR materials not related to CCR pond operations were found to be used as pipe backfill over the snowmelt lines and as subbase fill under a former gravel parking and work pad constructed east of the CCR ponds. The pad and snowmelt line had been covered with topsoil and supports vegetation. Ryan continued to have sand/topsoil delievered and they continued to lay it on verified areas via dozer. They do not plan to work tomorrow and hope to do additional test pits further off the CCR boundaries to determine the extent of the ash, once they are certain of where the utilities in the area lie.

Summary of CQA Activities

Site visit and observation of construction activities. Blaine was present while Ryan dug two test pits earlier in the morning. Samples were taken at each pit and test pit 2 was observed under the microscope and determined to be purely ash. Both samples were delivered to ALS for total and SPLP of metals.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/11/2018

Project Number: 133-17-001

General picture from today's site visit

East edge of the current Area of CCR removal limits

View of Test Pit 2

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/14/2018

Project Number: 133-17-001

Time Arrived: 1:10 Time Left: 1:40 Page: 1 of 1

Weather: Cloudy Precipitation: Rain Temp: 66 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan continued to place sand backfill on verified areas via dozer. They will have two visual points accessible tomorrow, however the rest of the points are still under CCR material. At time of visit they were waiting to hear whether they would have to chase the ash found in the berm outside of current CCR limits.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/14/2018

Project Number: 133-17-001

General picture from today's site visit

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/15/2018

Project Number: 133-17-001

Time Arrived: 9:40 Time Left: 12:05 Page: 1 of 1

Weather: Cloudy Precipitation: Rain earlier in day Temp: 63 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

Ryan has cleared up to the eastern edge of the current CCR boundaries via excavator and dozer. John followed along the berm with the excavator, digging several test pits to determine the CCR boundaries along the berms. After digging the test pits Ryan operators began to tear out the trees and topsoil on the north portion of the berm.

Summary of CQA Activities

Site visit and observation of construction activities. Had John dig nine additional test pits along the berms. Determined Test Pits 3, 4, 5, and 6 to have ash present - with the amount of ash becoming less the farther south we went. Test Pits 7, 8, and 9 were free of ash. Test Pits 10 and 11 had ash present as well. Based on the test pits, the CCR boundaries were updated on the testing grid, with more visual points added starting at Point 4200.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/15/2018

Project Number: 133-17-001

Eastern edge of current CCR boundaries

Overview of Test Pits done today

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/16/2018

Project Number: 133-17-001

Time Arrived: 2:47 Time Left: 4:47 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 70 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to have CCR material trucked off site. No sand or topsoil was delivered today. They started to excavate from the south working north within the newly found CCR area, where CCR material was historically used as construction backfill, via excavator and dozer. They plan to save and re-use the uncontaminated topsoil and clay.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4077, 4177, 4175, 4173, 4176, 4222, 4227, 4228, 4231, 4223, 4218, and 4067. Took a sample for ALS at point 4227 but did not drop it off - plan to tomorrow with additional samples. Looked at points 4173, 4176, 4177, and 4218 under the microscope. 4173 and 4218 were verified - asked John Johnson to further remove CCR from 4176 and 4177.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/16/2018

Project Number: 133-17-001






Excavation of CCR material in the newly added CCR area

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/17/2018

Project Number: 133-17-001

Time Arrived: 2:00 Time Left: 3:50 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 83 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to excavate CCR material via excavator and dozer. They had placed sand on the verified areas from yesterday and were placing topsoil on top of the sand backfill at time of visit by CQA. They further removed CCR from Points 4176 and 4177 a few inches.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4013, 4014, 4229, and 4232. Dropped four samples off to ALS by 5 pm (4013, 4014, 4232, and 4227 from yesterday). Observed at points 4176, 4177, and 4229 under microscope. Let John know that point 4229 needed additional excavating and that CQA would need to re-document the point.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/17/2018

Project Number: 133-17-001

Excavation of CCR material in the newly added CCR area boundaries

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/18/2018

Project Number: 133-17-001

Time Arrived: 11:30 / 1:45 Time Left: 11:50 / 2:45 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 68 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnson, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

(AM) Ryan had 2 operators on site using both dozers to continue grading the topsoil placed on verified areas. They could not get haul trucks for the CCR material today or tomorrow to take the material off-site.
(PM) Rob and John were present, using the excavator to excavate additional points in the area where CCR material was historically used as construction backfill. They do not plan to work tomorrow (Saturday).

Summary of CQA Activities

Site visit and observation of construction activities. Documented the verification of points 4033, 4044, and 4045. Point 4033 was delieverd to ALS for metals testing. Was not able to re-visit point 4229 due to water. Rob said they will continue to pump water out of the area over the weekend and revisit it Monday.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/18/2018

Project Number: 133-17-001

Overview of site from 5-18-18

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/21/2018

Project Number: 133-17-001

Time Arrived: 8:40 Time Left: 9:05 Page: 1 of 1

Weather: Cloudy Precipitation: Light drizzle Temp: 56 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - Rob Koski, John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to excavate the area where CCR material was historically used as construction backfill via excavator and dozer. They do not plan to have any new points ready for verification today due to expected rain. John asked EES to look at two samples under a microscope just to have an idea of what material needs to be excavated in the area - one sample was a light grey silt with peat layers; the second was a brown sandy topsoil.

Summary of CQA Activities

Site visit and observation of construction activities. Looked at two samples under microscope as requested by John. Both areas where materials were found required additional excavation.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/21/2018

Project Number: 133-17-001

Overview of site from 5-21-18

Materials observed via microscope at request of John.
Both needed slightly more excavating.

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/22/2018

Project Number: 133-17-001

Time Arrived: 11:20 Time Left: 12:05 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 58 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - John Johnson, 3 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to have CCR material trucked out today. Total trucks for the day is estimated to be around six. They do not plan to have any points ready today due to rain yesterday and standing water on site. Some of their pumping equipment has been removed from site so they are limited in how much water they can pump each day. Plan for tomorrow was to verify some points, but their dozer broke down and they will have to get a new one to the site. John said he will keep EES up to date on what's needed.

Summary of CQA Activities

Site visit and observation of construction activities.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/22/2018

Project Number: 133-17-001

Overview of site from 5-22-18

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/23/2018

Project Number: 133-17-001

Time Arrived: 9:25 Time Left: 4:40 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 51 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan continued to excavate CCR material from the area where CCR material was historically used as construction backfill. They have placed a layer of clay (reused), followed by sand and topsoil, on the points already verified/documented They had several points ready for documentation throughout various times of the day.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4225, 4230, 4226, 4229 (revisit), 4224, 4219, 4215, and 4220. Points 4224 and 4220 were delivered to ALS for metals testing right at 5 pm. Started gathering topsoil depths and elevations for the south portion of the CCR area points that were verified this spring and have already been covered with sand and topsoil. Observed the holes placed along the snowmelt lines under the supervision of Andrew. Surveyed their locations as 52320181-52320192 (12 holes total). Each hole was approximately 4.5' in depth. Gathered four random samples of the backfill over the snowmelt lines from the holes, and after looking at the samples under the microscope, it was confirmed each sample does have a soil-ash mix present to various degrees.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/23/2018

Project Number: 133-17-001



Holes over snowmelt lines

Overview of site from south fence





Pictures of CCR area under excavation

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/24/2018

Project Number: 133-17-001

Time Arrived: 9:30 Time Left: 1:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 81 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan continued to excavate CCR material from the area where CCR material was historically used as construction backfill. They have placed a layer of clay (reused), followed by sand and topsoil, on the points already verified/documented. They have several trucks delivering sand today, and plan to have additional points ready this afternoon. Each morning they are having to spend some time pumping the groundwater that is coming up to the surface over night before they begin excavating.

Summary of CQA Activities

Site visit and observation of construction activities. Documentation of Points 4216, 4213, 4212, and 4174. Started gathering topsoil depths and elevations for the northern portion of the CCR/coal area points that were verified last fall, but either had stockpiles or were not graded until this spring. Took utilities samples 1-4 and dropped them off to ALS for arsenic testing. Ryan will be excavting to the snowmelt lines utility easement but not within or past as the lines are active and cannot risk damage. Blaine asked John to have the middle of the site re-graded due to ponding water in several low spots.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/24/2018

Project Number: 133-17-001

CCR area under excavation

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/25/2018

Project Number: 133-17-001

Time Arrived: 9:30 Time Left: 10:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 82 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 3 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

Ryan continued to excavate CCR material from the area where CCR material was historically used as construction backfill. They have several trucks delivering sand today, and several trucks taking out CCR material today.

Summary of CQA Activities

Site visit and observation of construction activities. John said they will work on excavating surface material today and will not have any points ready for verification until Tuesday due to the holiday.

Notes:

Andrew and John were present while a vaccum truck dug holes to determine the exact locations of the snowmelt lines. John then surveyed the lines and e-mailed the northings, eastings, elevations, and descriptions to EES and the HBPW. They found four points along both of the 18" lines and only one point each along the 12" lines. Andrew said the HBPW would like Ryan to excavate up to 4' west of the lines. They would also like to stay west of the existing light pole out there, and then go directly towards the building from there for the eastern CCR area boundary.

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/25/2018

Project Number: 133-17-001

Snowmelt lines

CCR area

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/29/2018

Project Number: 133-17-001

Time Arrived: 9:15 / 1:15 Time Left: 10:45 / 4:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 87 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

(AM) Ryan continued to pump surface water form the site and excavate CCR material. They started to re-grade the center of the site at a 1% slope/swale to help prevent ponding after storm events.
(PM) Ryan excavated the CCR area with me present so that samples and documentaiton could be made right away, before the area filled back up with water. They then used the dozer to immediately place sand backfill on the documented area. They excavated up to 4' west of the snowmelt lines, and then at a radius up until the light pole.

Summary of CQA Activities

(AM) Site visit and observation of construction activities. Hand augered down 1.5' at Points 4208 and 4211 to grab samples for metals testing by ALS. Delivered the samples to ALS by noon.
(PM) Verified points 4221, 4217, 4214 (sample), 4210, 4209 (sample), and 4172 (sample). Point 4214 was documented/sampled 4' west of the point due to it being located within the snowmelt lines. Dropped off three samples to ALS by 5.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/29/2018

Project Number: 133-17-001

CCR area under excavation

Re-grading of the middle of the site via dozer

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/30/2018

Project Number: 133-17-001

Time Arrived: 2:00 Time Left: 5:00 Page: 1 of 1

Weather: Clear Precipitation: Some light rain Temp: 84 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - John Johnson, 2 operators
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Ryan continued to pump surface water from the site and excavate CCR material. During the morning Ryan pumped water and cleared surface CCR material. In the afternoon Ryan excavated the CCR area further while I was present to the underlying natural soils so that samples and documentaiton could be made right away, before the area filled back up with water. They then used the dozer to immediately place sand backfill on the documented area. They didn't excavate any further than a line directly north from the light pole, at the request of Andrew.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4206, 4171, 4034, 4023, 4024, 4169, 4170, and 4204. The two samples taken (4204 and 4169) were dropped off to ALS on the morning of 5-31-2018.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/30/2018

Project Number: 133-17-001

CCR area under excavation

Verified CCR area backfilled with sand

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/31/2018

Project Number: 133-17-001

Time Arrived: 11:30 / 4:15 Time Left: 3:15 / 5:50 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 82 °F

Personnel on Site

Owners:	HBPW - Andrew Reynolds
Contractors:	Ryan Inc. - John Johnson, 2 operators
Contractors:	
CQA:	E&E Solutions, Amy Mandrell
Other:	

Summary of Construction Activities

During the morning, Ryan pumped water and cleared surface CCR material. In the afternoon, Ryan excavated the CCR area further. Sand and topsoil were delivered and placed on the verified areas and graded with a dozer. They also demo'd and capped the abandoned portion of the snowmelt line after speaking with Andrew. They cut it with a chainsaw, placed a cap, then pulled the pipe out with a chain attached to the dozer.

Summary of CQA Activities

Site visit and observation of construction activities. Documented points 4015 and 4168. Point 4200 was hard to reach at an elevation of 576 and filling back up with water, as it's below Lake Macatawa's water level of 581. Andrew said not to dig any deeper because there is a working sanitary line in that area. Andrew requested that I take a bag sample of the ash left in the ground and to leave the point as-is. Finished gathering topsoil depths/elevations for the points that had sand/topsoil stockpiled on them over the winter. Found a gray looking material at Points 246, 4146, and 4147 during soil depth measurements. Looked at it via microscope with Kurt and determined it to be a natural material.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 5/31/2018

Project Number: 133-17-001

After re-grading, site is ponding less after rain events

Area of excavation

Portion of the dead snowmelt line being demo'd

Natural material found at Points 246, 4146, and 4147 during soil depth measurements. Verified via microscope, that it is natural material.

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 6/1/2018

Project Number: 133-17-001

Time Arrived: 2:00 Time Left: 4:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 94 °F

Personnel on Site

Owners:
Contractors: Ryan Inc. - John Johnson, 2 operators
Contractors:
CQA: E&E Solutions, Blaine Litteral, Amy Mandrell
Other:

Summary of Construction Activities

By time of visit Ryan had the majority of the excavated CCR material already trucked off site, and the last point (4201) excavated and ready for documentation. They continued to place sand and topsoil on verified areas. They left some CCR material used as pipe backfill or a parking area subgrade in the northeast corner of the site near the utilities, as they didn't want to excavate too closely to them.

Summary of CQA Activities

Site visit and observation of construction activities. Documented point 4201 and dropped a sample off to ALS. Took three additional density tests all located within the northeast corner of the site - all passed. Surveyed along the line where CCR material was left behind in the northeast corner. Blaine asked John to smooth out the grading on the entire site - lots of bumps were present.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 6/1/2018

Project Number: 133-17-001

Area of excavation

Edge of CCR left in place

Cap on snowmelt line

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 6/4/2018

Project Number: 133-17-001

Time Arrived: 9:00 Time Left: 12:30 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 64 °F

Personnel on Site

Owners:	HBPW - Andrew Johnson
Contractors:	Ryan Inc. - John Johnson, 1 operator
Contractors:	
CQA:	E&E Solutions, Blaine Litteral, Amy Mandrell
Other:	

Summary of Construction Activities

Over the weekend Ryan finished placing/grading the sand and topsoil. They also re-placed the styrofoam and backfilled with soil the vaccum holes made to determine the location of the snowmelt lines. At time of visit the operator was working on making the edges of the site look nice using the skidsteer. They were having equipment taken off of the site, and they do not plan to seed until Friday.

Summary of CQA Activities

Site visit and observation of construction activities. Surveyed the eatern disturbed area boundary. Finished up topsoil elevation/depth survey.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Date: 6/4/2018

Project Number: 133-17-001

Overview pictures of the site

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material Date: 6/15/2018

Project Number: 133-17-001

Time Arrived: 9:20 Time Left: 10:00 Page: 1 of 1

Weather: Clear Precipitation: None Temp: 65 °F

Personnel on Site

Owners:
Contractors:
Contractors:
CQA: E&E Solutions, Amy Mandrell
Other:

Summary of Construction Activities

Summary of CQA Activities

Site visit to observe site after hydroseeding performed by Ryan on 6/13/2018.

Notes:

Inspector: Amy Mandrell Signature: Amy Mandrell

Engineering & Environmental Solutions, LLC

Progress Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

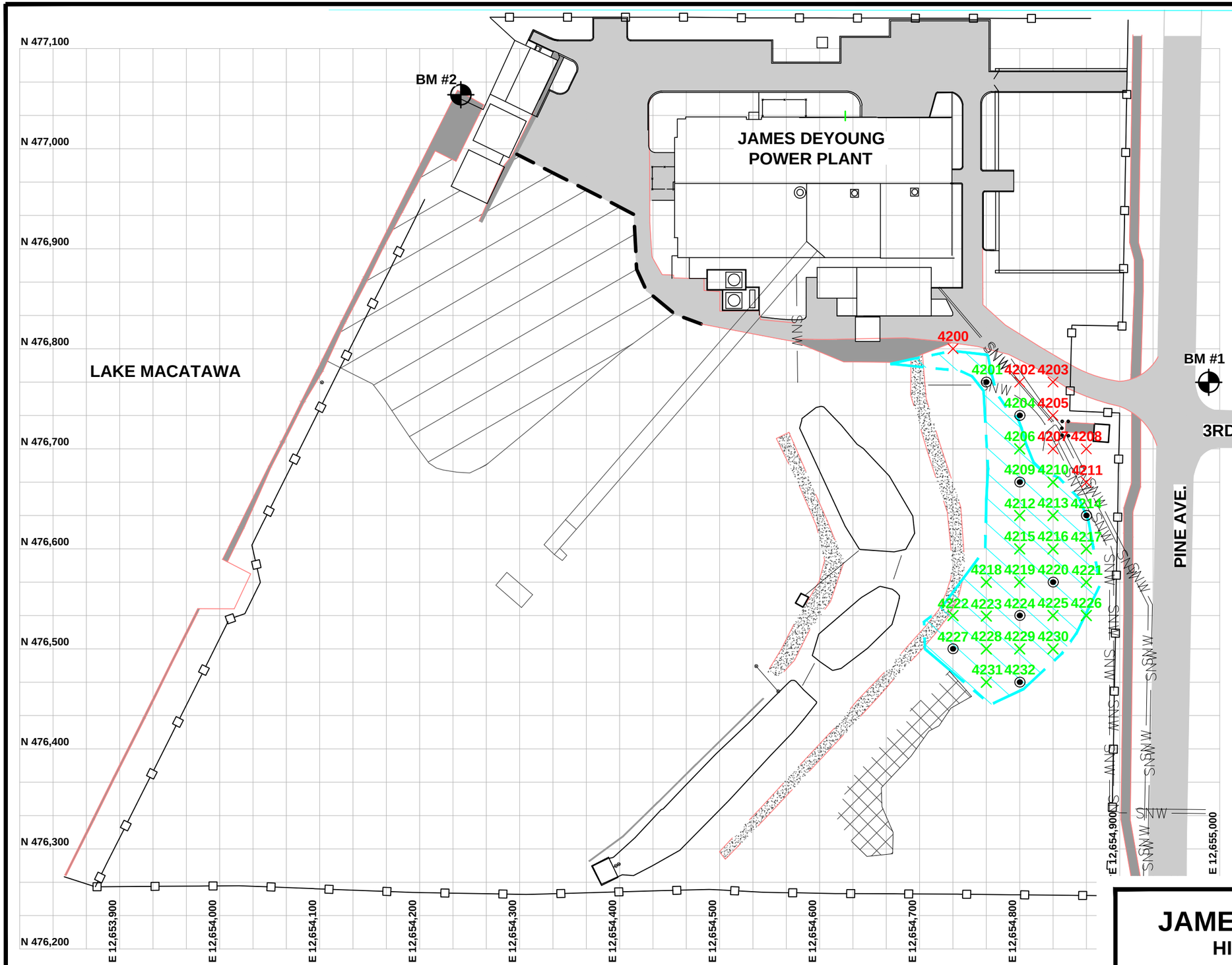
Date: 6/15/2018

Project Number: 133-17-001

Overview pictures of the site after seeding

APPENDIX B.1

CCR INVESTIGATION AND REMOVAL DOCUMENTATION



LEGEND

- APPROXIMATE LIMITS OF HISTORICAL CCR BACKFILL
- EXISTING FENCE
- EXISTING BENCHMARK
- AREA OF CCR REMOVAL
- EXISTING LANDSCAPING
- GRID NODE
- GRID NODE - APPROVED FOR BACKFILL
- GRID NODE - SAMPLED FOR METALS
- GRID NODE - LOCATED WITHIN SNOWMELT LINE UTILITY EASEMENT

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

N

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JAMES DEYOUNG POWER PLANT

HISTORICAL CCR MATERIAL REMOVAL DOCUMENTATION - GRID NODES

SCALE 1" = 100'	DRAWING NO.	FIGURE 1A	REV.
FOR 11" x 17" SHEET			

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4201

Project Number: 133-17-001

Brown silty fine sand

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4204

Project Number: 133-17-001

Light-dark brown silty fine sand with trace shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4206

Project Number: 133-17-001

Brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4209

Project Number: 133-17-001

Brown silty fine sand with trace gravel and shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

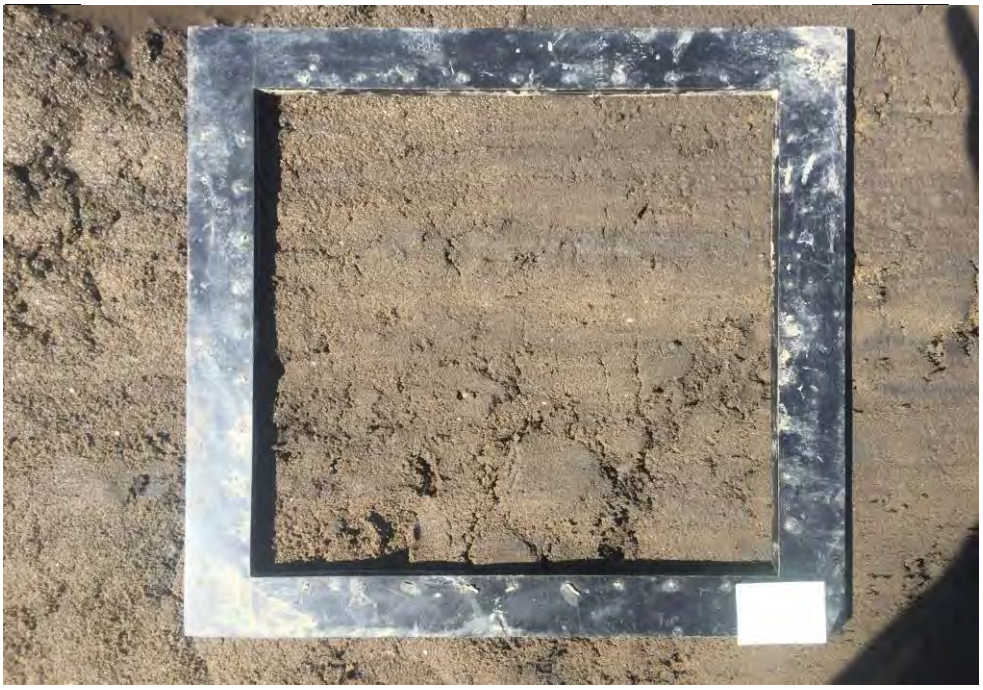
Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4210

Project Number: 133-17-001

Brown silty fine sand with trace gravel

Brown silty fine sand



Dark brown silty fine sand

Engineering & Environmental Solutions, LLC

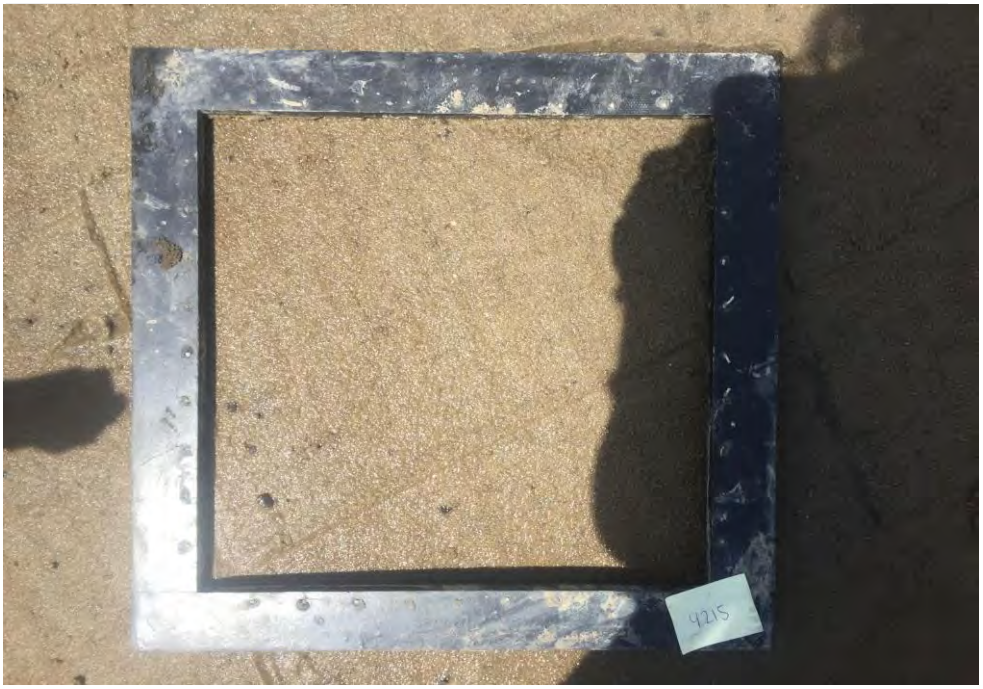
Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4214

Project Number: 133-17-001

Brown silty fine sand



Brown silty fine sand

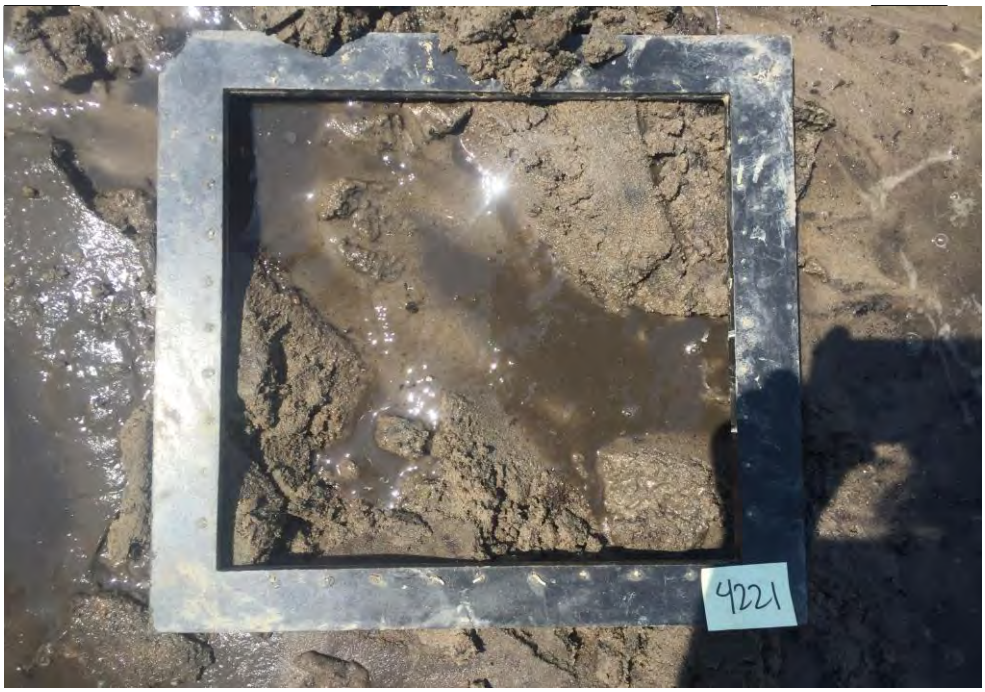
Brown silty fine sand

Brown silty fine sand

Gray clayey silt with trace peat

Brown silty fine sand with trace gravel and sand

Brown silty fine sand with trace shells



Brown silty fine sand with trace peat

Brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4223

Project Number: 133-17-001

Brown silty fine sand with trace gravel

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4224

Project Number: 133-17-001

Gray silty fine sand with trace gravel and shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4225

Project Number: 133-17-001

Gray silty fine sand with trace gravel and shells

Brown silty fine sand with trace gravel

Brown silty fine sand with trace gravel and shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4228

Project Number: 133-17-001

Brown silty fine sand with trace gravel and shells

Engineering & Environmental Solutions, LLC

Documentiaton Pictures

Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Points: 4229

Project Number: 133-17-001

Gray silty fine sand with trace gravel

Gray silty fine sand with trace gravel and shells

Brown silty fine sand with trace gravel

Brown silty fine sand with black peat and clay layers and trace shells

APPENDIX B.1.1

MICROSCOPE EVALUATION

Engineering & Environmental Solutions, LLC

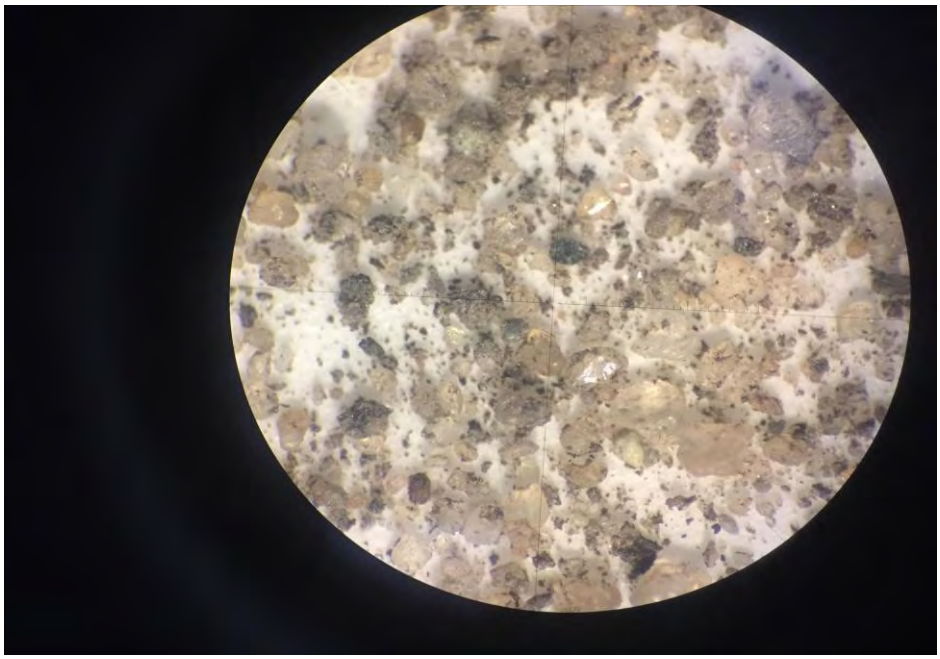
Microscope Evaluation

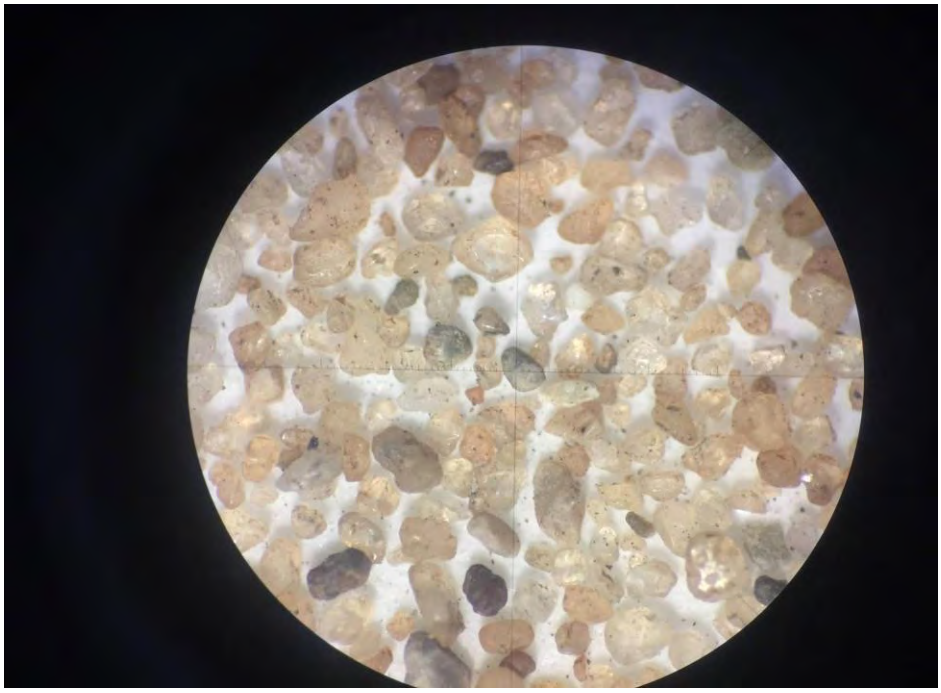
Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Project Number: 133-17-001

Points: 4213

4216





Engineering & Environmental Solutions, LLC

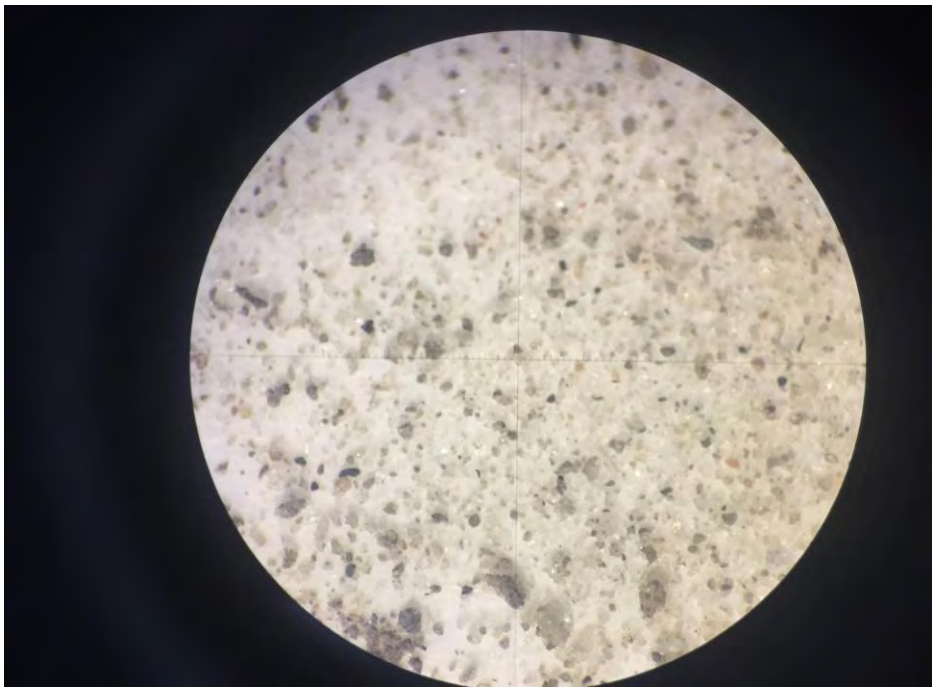
Microscope Evaluation

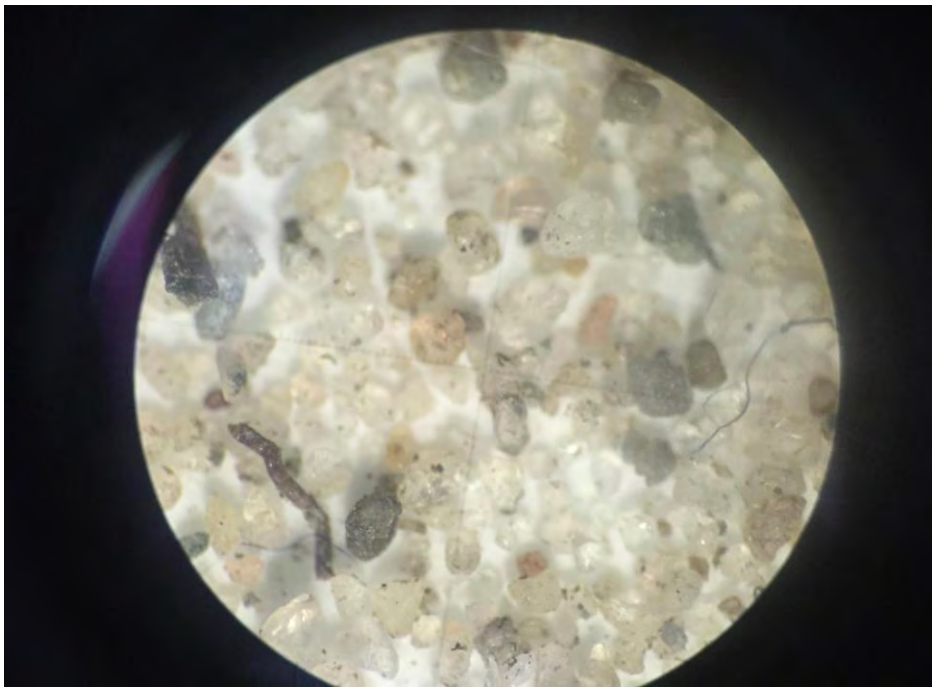
Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Project Number: 133-17-001

Points: 4218

4224





Engineering & Environmental Solutions, LLC

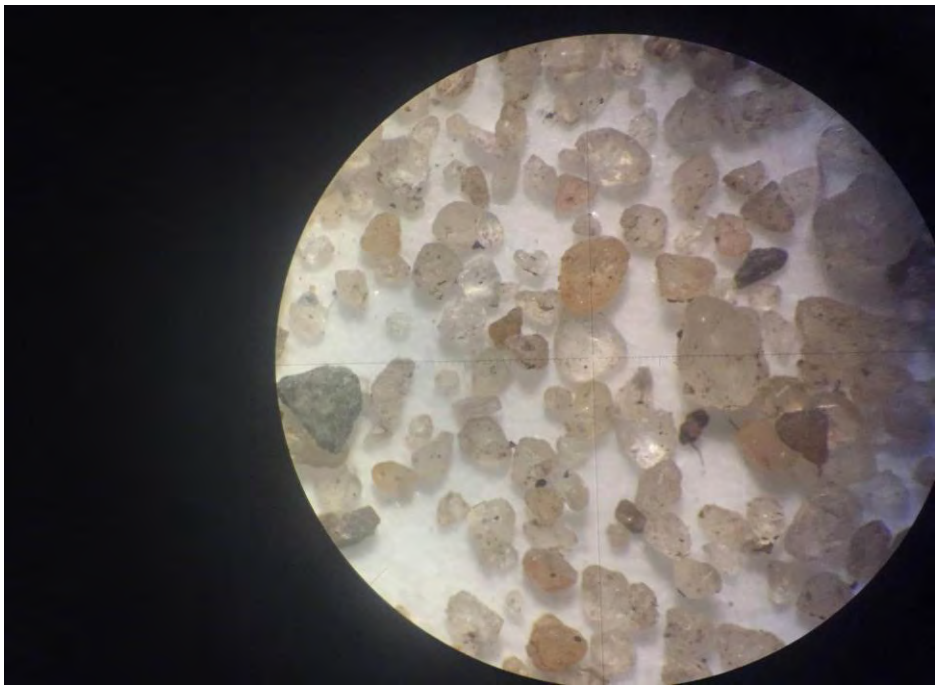
Microscope Evaluation

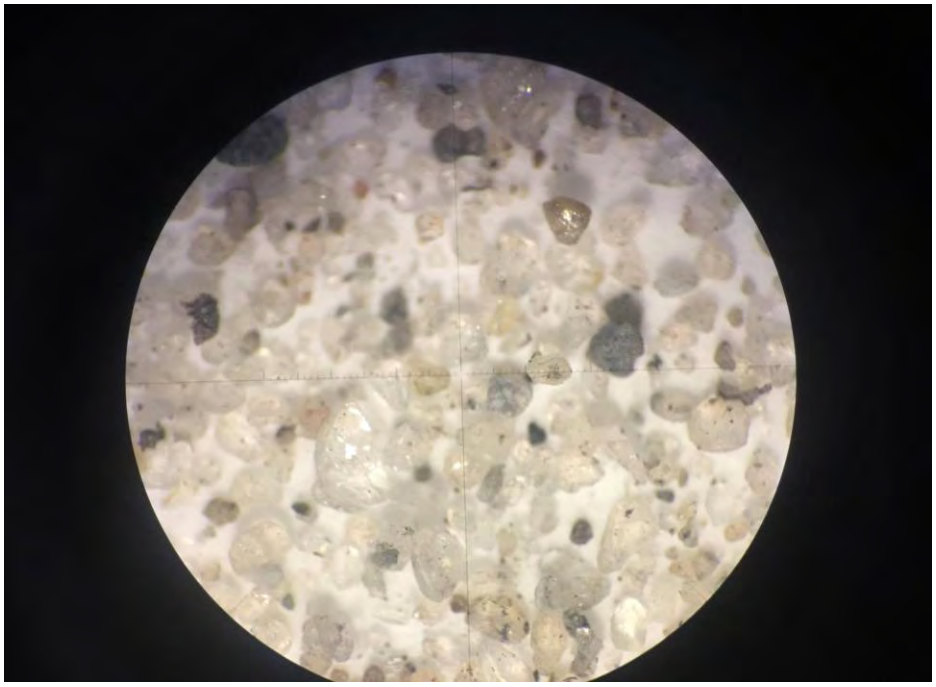
Project: James DeYoung Power Plant Historical Beneficially Reused CCR Material

Project Number: 133-17-001

Points: 4228

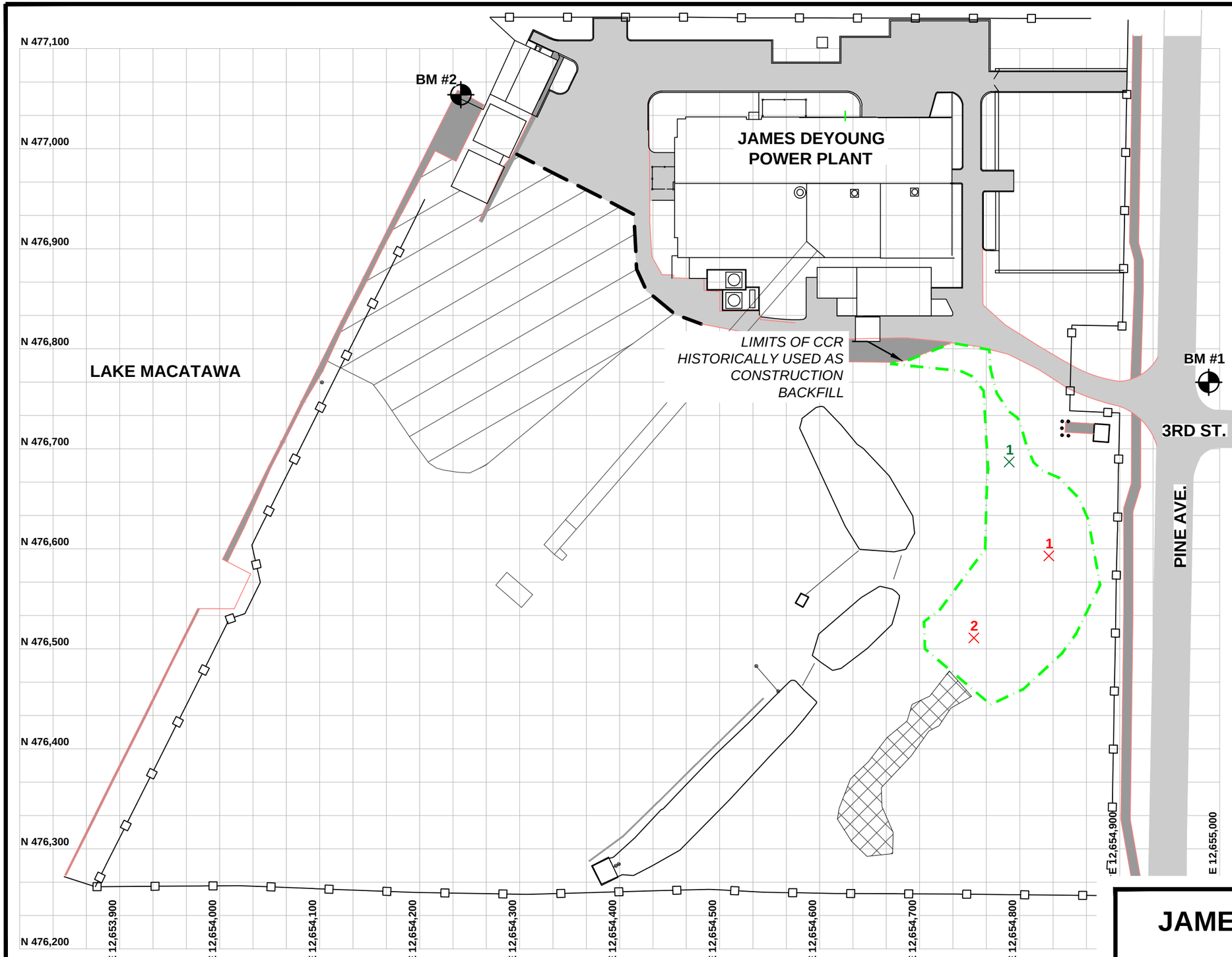
4229





APPENDIX B.2

FIELD DENSITY TESTING LOCATIONS



LEGEND

- APPROXIMATE LIMITS OF CCR HISTORICALLY USED AS CONSTRUCTION BACKFILL
- EXISTING FENCE
- EXISTING BENCHMARK
- EXISTING LANDSCAPING
- DENSITY TEST LOCATION - 6/1/2018 (1)
- DENSITY TEST LOCATION - 7/16/2018 (1)

NOTES

1. COORDINATES SHOWN ARE ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH ZONE, INTERNATIONAL FEET.
2. ELEVATIONS SHOWN ARE ON THE NAVD88 DATUM.
3. UTILITIES ARE NOT SHOWN FOR CLARITY

N

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JAMES DEYOUNG POWER PLANT

TROXLER DENSITY GAUGE - TESTING LOCATIONS

SCALE 1" = 100'	DRAWING NO.	FIGURE 1A	REV.
FOR 11" x 17" SHEET			

APPENDIX C.1

TOTAL CONCENTRATION SUMMARY: TABLE 1

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Material Historically Used as Construction Backfill Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4201	4204	4209	4214	4220	4224	4227
							6/1/18	5/30/18	5/29/18	5/29/18	5/23/18	5/23/18	5/16/18
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	<21	<21	<18	<18	**160**	<19	<21
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000							
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	750	1,100	1,900	2,000	4,200	1,500	560
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	7,400	11,000	6,200	11,000	73,000	6,700	5,300
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	<160	<190	<180	<180	360	<170	<150
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	1,900	<1,900	<1,800	<1,800	8,700	<1,700	<1,500
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	<80	<93	<90	<88	750	<85	<77
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)							
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000							
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	920	1,300	800	1,200	24,000	3,800	3,100
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	4,200	2,500	1,500	3,500	9,200	2,600	1,500
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	<400	<470	610	1,600	<560	900	<390
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	510	370	**1,200**	310	**1,900**	400	540
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000							
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)							
Fluoride													
Sulfate	NA	5.00E+06	NA	NA	ID	ID	34,000	<43,000	<12,000	<12,000	<13,000	<12,000	<11,000
Radium 226													
Radium 228													

Notes:

Underlined value is the highest applicable criteria (Residential Direct Contact must be met also if alternate testing is performed)

Bold indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria

Bold/italic indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria and Residential Contact value

G = Aquatic toxicity is proportional to water hardness; These GSI values have been calculated based on a water hardness of 220 ppm measured in a sample collected from Lake Macatawa.

X means the criteria is the drinking water standard if close to drinking water intake

Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

TABLE 1

SUMMARY OF ANALYTICAL RESULTS - TOTAL CONCENTRATIONS

James DeYoung CCR Material Historically Used as Construction Backfill Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point						
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4232						
							5/17/18						
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	**52**						
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000							
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	2,500						
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	53,000						
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	<240						
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	7,400						
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	370						
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)							
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000							
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000							
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	13,000						
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	6,900						
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	<590						
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	**1,300**						
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000							
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)							
Fluoride													
Sulfate	NA	5.00E+06	NA	NA	ID	ID	<14,000						
Radium 226													
Radium 228													

Notes:

Underlined value is the highest applicable criteria (Residential Direct Contact must be met also if alternate testing is performed)

Bold indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria

Bold/italic indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria and Residential Contact value

G = Aquatic toxicity is proportional to water hardness; These GSI values have been calculated based on a water hardness of 220 ppm measured in a sample collected from Lake Macatawa.

X means the criteria is the drinking water standard if close to drinking water intake

Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

APPENDIX C.2

SPLP CONCENTRATION SUMMARY: TABLE 2

TABLE 2

SUMMARY OF ANALYTICAL RESULTS - SPLP CONCENTRATIONS

James DeYoung CCR Material Historically Used as Construction Backfill Closure

Hazardous Substance	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Sample Point				
				4220				
Antimony	6.0 (A)	6.0 (A)	130 (X)					
Arsenic	10 (A)	10 (A)	10					
Barium (B)	2,000 (A)	2,000 (A)	1,000 (G)					
Beryllium	4.0 (A)	4.0 (A)	18 (G)					
Boron (B)	500 (F)	500 (F)	7,200 (X)					
Cadmium (B)	5.0 (A)	5.0 (A)	2.5 (G,X)					
Chloride	2.5E+5 (E)	2.5E+5 (E)	(FF)					
Chromium (III) (B,H)	100 (A)	100 (A)	120 (G,X)					
Chromium (VI)	100 (A)	100 (A)	11					
Cobalt	40	100	100					
Lead (B)	4.0 (L)	4.0 (L)	14 (G,X)					
Lithium (B)	170	350	440					
Mercury (Total) (B,Z)	2.0 (A)	2.0 (A)	0.0013	<0.2				
Molybdenum (B)	73	210	3,200 (X)					
Selenium (B)	50 (A)	50 (A)	5					
Sulfate	2.5E+5 (E)	2.5E+5 (E)	NA					
Thallium (B)	2.0 (A)	2.0 (A)	3.7 (X)					

Notes:

All concentrations in ug/l

APPENDIX C.3

UTILITY EASEMENT ANALYTICAL SUMMARY: TABLE 3

TABLE 3

SUMMARY OF ANALYTICAL RESULTS - UTILITY EASEMENT - TOTAL CONCENTRATIONS

James DeYoung CCR Material Historically Used as Construction Backfill Closure

Hazardous Substance	Statewide Default Background Level	Groundwater Protection		Regional background for sand in Michigan Lobe	Residential Direct Contact	Nonresidential Direct Contact	Sample Point					
		Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria				4208	4211				
							5/29/18	5/29/18				
Mercury (Total) (B,Z)	130	1,700	50 (M); 1.2	100	160,000	5.80E+05	**190**	38				
Antimony	NA	4,300	94,000 (X)	5000	180,000	670,000						
Arsenic	5,800	4,600	4,600	5,700	7,600	37,000	***24,000***	***12,000***				
Barium (B)	75,000	1.30E+06	660,000 (G)	62,500	37,000,000	130,000,000	530,000	77,000				
Beryllium	NA	51,000	220,000 (G)	1,000	410,000	1,600,000	1,300	450				
Boron (B)	NA	10,000	1.4E+5 (X)	NA	4.80E+07	3.5E+8 (DD)	8,100	<4,600				
Cadmium (B)	1,200	6,000	3,000 (G,X)	2,000	550,000	2,100,000	370	1,900				
Chromium (III) (B,H)	18,000 (total)	1.0E+9 (D)	4.1 E+9 (G,X)	18,700 (total)	7.90E+08	1.0E+9 (D)						
Chromium (VI)	NA	30,000	3,300	NA	250,000	9,200,000						
Cobalt	6,800	800	2,000	15,200	2,600,000	9,000,000						
Lead (B)	21,000	7.00E+05	2,500,000 (G,X)	17,700	400,000	9.0E+5 (DD)	18,000	18,000				
Lithium (B)	9,800	3,400	8,800	11,600	4,200,000	3.1E+7 (DD)	5,400	4,500				
Molybdenum (B)	NA	1,500	64,000 (X)	<5,000	2,600,000	9,600,000	1,500	1,900				
Selenium (B)	410	4,000	400	1,000	2,600,000	9,600,000	**2,600**	**2,300**				
Thallium (B)	NA	2,300	4,200 (X)	1,700	35,000	130,000						
Chloride	NA	5.00E+06	X		5.0E+5 (F)	5.0E+5 (F)						
Fluoride												
Sulfate	NA	5.00E+06	NA	NA	ID	ID	<13,000	<11,000				
Radium 226												
Radium 228												

Notes:

Underlined value is the highest applicable criteria (Residential Direct Contact must be met also if alternate testing is performed)

Bold indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria

Bold/italic indicates the value exceeds the Statewide or Regional Background Defualt or the GSI protection criteria and Residential Contact value

G = Aquatic toxicity is proportional to water hardness; These GSI values have been calculated based on a water hardness of 220 ppm measured in a sample collected from Lake Macatawa.

X means the criteria is the drinking water standard if close to drinking water intake

Concentrations in mg/kg dry weight, with exception of Radium 226 and Radium 228 concentrations in pCi/g

APPENDIX C.4

ALS REPORTS OF LABORATORY ANALYSIS

21-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18051210**

Dear Blaine,

ALS Environmental received 4 samples on 17-May-2018 04:45 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 15.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Certificate No: MN 998501

Report of Laboratory Analysis

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18051210**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051210-01	4013	Soil		5/17/2018 14:05	5/17/2018 16:45	☐
18051210-02	4014	Soil		5/17/2018 14:30	5/17/2018 16:45	☐
18051210-03	4232	Soil		5/17/2018 15:30	5/17/2018 16:45	☐
18051210-04	4227	Soil		5/16/2018 16:00	5/17/2018 16:45	☐

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18051210**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051210
Sample ID: 4013
Lab ID: 18051210-01
Collection Date: 5/17/2018 02:05 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/18/18 07:35		Analyst: **RSH**
Mercury	ND		0.020	mg/Kg-dry	1	5/18/2018 10:32 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/18/18 12:26		Analyst: **JF**
Arsenic	**1.5**		**0.055**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
Barium	**5.9**		**0.46**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/18/2018 05:33 PM
Boron	ND		1.8	mg/Kg-dry	1	5/18/2018 05:33 PM
Cadmium	ND		0.091	mg/Kg-dry	1	5/18/2018 05:33 PM
Lead	**1.4**		**0.46**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
Lithium	**2.0**		**0.18**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
Molybdenum	ND		0.46	mg/Kg-dry	1	5/18/2018 05:33 PM
Selenium	**0.95**		**0.091**	**mg/Kg-dry**	1	5/18/2018 05:33 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**13**		**0.050**	**% of sample**	1	5/17/2018 07:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/17/18 18:30		Analyst: **STP**
Sulfate	**78**		**11**	**mg/Kg-dry**	1	5/18/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051210
Sample ID: 4014
Lab ID: 18051210-02
Collection Date: 5/17/2018 02:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/18/18 07:35		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	5/18/2018 10:35 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/18/18 12:26		Analyst: **JF**
Arsenic	**1.3**		**0.058**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Barium	**6.4**		**0.48**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Beryllium	ND		0.19	mg/Kg-dry	1	5/18/2018 05:40 PM
Boron	**2.0**		**1.9**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Cadmium	ND		0.097	mg/Kg-dry	1	5/18/2018 05:40 PM
Lead	**1.7**		**0.48**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Lithium	**2.1**		**0.19**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Molybdenum	**0.64**		**0.48**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
Selenium	**0.49**		**0.097**	**mg/Kg-dry**	1	5/18/2018 05:40 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**23**		**0.050**	**% of sample**	1	5/17/2018 07:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/17/18 18:30		Analyst: **STP**
Sulfate	**29**		**13**	**mg/Kg-dry**	1	5/18/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051210
Sample ID: 4232
Lab ID: 18051210-03
Collection Date: 5/17/2018 03:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/18/18 07:35		Analyst: **RSH**
Mercury	**0.052**		**0.024**	**mg/Kg-dry**	1	5/18/2018 10:38 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/18/18 12:26		Analyst: **JF**
Arsenic	**2.5**		**0.071**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Barium	**53**		**0.59**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Beryllium	ND		0.24	mg/Kg-dry	1	5/18/2018 05:42 PM
Boron	**7.4**		**2.4**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Cadmium	**0.37**		**0.12**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Lead	**13**		**0.59**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Lithium	**6.9**		**0.24**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
Molybdenum	ND		0.59	mg/Kg-dry	1	5/18/2018 05:42 PM
Selenium	**1.3**		**0.12**	**mg/Kg-dry**	1	5/18/2018 05:42 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**30**		**0.050**	**% of sample**	1	5/17/2018 07:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/17/18 18:30		Analyst: **STP**
Sulfate	ND		14	mg/Kg-dry	1	5/18/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *21-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051210
Sample ID: 4227
Lab ID: 18051210-04
Collection Date: 5/16/2018 04:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/18/18 07:35		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	5/18/2018 10:53 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/18/18 12:26		Analyst: **JF**
Arsenic	**0.56**		**0.046**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
Barium	**5.3**		**0.39**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
Beryllium	ND		0.15	mg/Kg-dry	1	5/18/2018 05:44 PM
Boron	ND		1.5	mg/Kg-dry	1	5/18/2018 05:44 PM
Cadmium	ND		0.077	mg/Kg-dry	1	5/18/2018 05:44 PM
Lead	**3.1**		**0.39**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
Lithium	**1.5**		**0.15**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
Molybdenum	ND		0.39	mg/Kg-dry	1	5/18/2018 05:44 PM
Selenium	**0.54**		**0.077**	**mg/Kg-dry**	1	5/18/2018 05:44 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**10**		**0.050**	**% of sample**	1	5/17/2018 07:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/17/18 18:30		Analyst: **STP**
Sulfate	ND		11	mg/Kg-dry	1	5/18/2018 12:45 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 21-May-18

Client: Engineering & Environmental Solutions

Work Order: 18051210

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118527** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-118527-118527**			Units: **mg/Kg**			Analysis Date: **5/18/2018 10:27 AM**			
Client ID:	Run ID: **HG1_180518A**			SeqNo: **5040138**			Prep Date: **5/18/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-118527-118527**			Units: **mg/Kg**			Analysis Date: **5/18/2018 10:30 AM**			
Client ID:	Run ID: **HG1_180518A**			SeqNo: **5040139**			Prep Date: **5/18/2018**		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: **18051210-03AMS**			Units: **mg/Kg**			Analysis Date: **5/18/2018 10:48 AM**			
Client ID: **4232**	Run ID: **HG1_180518A**			SeqNo: **5040147**			Prep Date: **5/18/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.2058	0.020	0.1665	0.03604	102	75-125	0			

MSD	Sample ID: **18051210-03AMSD**			Units: **mg/Kg**			Analysis Date: **5/18/2018 10:50 AM**			
Client ID: **4232**	Run ID: **HG1_180518A**			SeqNo: **5040148**			Prep Date: **5/18/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.2792	0.020	0.1665	0.03604	146	75-125	0.2058	30.2	35	S

The following samples were analyzed in this batch:

18051210-01A	18051210-02A	18051210-03A
18051210-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051210
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118554** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-118554-118554** Units: **mg/Kg** Analysis Date: **5/18/2018 04:41 PM**
Client ID: Run ID: **ICPMS3_180518A** SeqNo: **5042693** Prep Date: **5/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	ND	1.0								
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-118554-118554** Units: **mg/Kg** Analysis Date: **5/18/2018 04:43 PM**
Client ID: Run ID: **ICPMS3_180518A** SeqNo: **5042694** Prep Date: **5/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.313	0.25	5	0	106	80-120	0			
Barium	5.46	0.25	5	0	109	80-120	0			
Beryllium	5.184	0.10	5	0	104	80-120	0			
Boron	25.36	1.0	25	0	101	80-120	0			
Cadmium	5.394	0.10	5	0	108	80-120	0			
Lead	5.332	0.25	5	0	107	80-120	0			
Lithium	5.383	0.50	5	0	108	80-120	0			
Molybdenum	5.424	0.25	5	0	108	80-120	0			

MS Sample ID: **18051158-08BMS** Units: **mg/Kg** Analysis Date: **5/18/2018 05:28 PM**
Client ID: Run ID: **ICPMS3_180518A** SeqNo: **5042722** Prep Date: **5/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.522	0.35	6.925	3.326	89.5	75-125	0			
Barium	60.16	0.35	6.925	108.9	-704	75-125	0			SO
Beryllium	6.847	0.14	6.925	0.2177	95.7	75-125	0			
Boron	35.87	1.4	34.63	2.903	95.2	75-125	0			
Cadmium	6.601	0.14	6.925	1.18	78.3	75-125	0			
Lead	69.4	0.35	6.925	75.27	-84.8	75-125	0			SO
Lithium	11.52	0.69	6.925	3.369	118	75-125	0			
Molybdenum	7.169	0.35	6.925	0.4733	96.7	75-125	0			
Selenium	7.006	0.35	6.925	1.06	85.9	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051210
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118554** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18051158-08BMSD** Units: **mg/Kg** Analysis Date: **5/18/2018 05:30 PM**
Client ID: Run ID: **ICPMS3_180518A** SeqNo: **5042723** Prep Date: **5/18/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.02	0.35	6.925	3.326	82.2	75-125	9.522	5.41	20	
Barium	67.37	0.35	6.925	108.9	-600	75-125	60.16	11.3	20	SO
Beryllium	6.806	0.14	6.925	0.2177	95.1	75-125	6.847	0.599	20	
Boron	36.2	1.4	34.63	2.903	96.2	75-125	35.87	0.908	20	
Cadmium	7.02	0.14	6.925	1.18	84.3	75-125	6.601	6.15	20	
Lead	82.1	0.35	6.925	75.27	98.7	75-125	69.4	16.8	20	O
Lithium	11.46	0.69	6.925	3.369	117	75-125	11.52	0.553	20	
Molybdenum	7.069	0.35	6.925	0.4733	95.2	75-125	7.169	1.41	20	
Selenium	7.032	0.35	6.925	1.06	86.2	75-125	7.006	0.372	20	

The following samples were analyzed in this batch:

18051210-01A	18051210-02A	18051210-03A
18051210-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051210
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118514** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-118514-118514** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040720** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

MS Sample ID: **18051089-02AMS** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040723** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	500.4	9.8	492.1	16.35	98.4	75-125	0			

MSD Sample ID: **18051089-02AMSD** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040724** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	519	9.9	496	16.35	101	75-125	500.4	3.66	20	

LCS1 Sample ID: **LCS1-118514-118514** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040729** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	106.9	10	100	0	107	80-120	0			

LCS2 Sample ID: **LCS2-118514-118514** Units: **mg/Kg** Analysis Date: **5/18/2018 12:45 PM**
Client ID: Run ID: **GALLERY_180518B** SeqNo: **5040730** Prep Date: **5/17/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	543.8	10	500	0	109	80-120	0			

The following samples were analyzed in this batch:

18051210-01A	18051210-02A	18051210-03A
18051210-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051210
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R236147** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R236147** Units: **% of sample** Analysis Date: **5/17/2018 07:00 PM**
Client ID: Run ID: **MOIST_180517D** SeqNo: **5040573** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R236147** Units: **% of sample** Analysis Date: **5/17/2018 07:00 PM**
Client ID: Run ID: **MOIST_180517D** SeqNo: **5040572** 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: **18051210-01A DUP** Units: **% of sample** Analysis Date: **5/17/2018 07:00 PM**
Client ID: **4013** Run ID: **MOIST_180517D** SeqNo: **5040552** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	12.61	0.050	0	0	0	0-0	13.36	5.78	10	

DUP Sample ID: **18051210-04A DUP** Units: **% of sample** Analysis Date: **5/17/2018 07:00 PM**
Client ID: **4227** Run ID: **MOIST_180517D** SeqNo: **5040556** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	10.61	0.050	0	0	0	0-0	10.12	4.73	10	

The following samples were analyzed in this batch:

18051210-01A	18051210-02A	18051210-03A
18051210-04A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39379

ALS Project Manager: | ALS Work Order #: 18051210

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CAPP	A	see attached
Work Order		Project Number	133-17-001	B	
Company Name	FES	Bill To Company	Holland BPW	C	
Send Report To	Blaine Litteral Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax	blaine.litteral@goeesolutions.net	Fax		I	
e-Mail Address	amy.mandrell@goeesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4013	5.17.18	2:05	Soil		1	X										
2	4014		2:30	Soil		1	X										
3	4232		3:30	Soil		1	X										
4	4227	5.16.18	4:00	Soil		1	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 5/17/18	Time: 1643	Received by:	
Relinquished by:	Date: 5/17/18	Time: 1643	Received by (Laboratory):	
Logged by (Laboratory): KEW	Date: 5/17/18	Time: 1645	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
SW	15.4°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **17-May-18 16:45**

Work Order: **18051210** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 17-May-18 (Date) Reviewed by: Bill Carey (eSignature) 18-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	15.4/15.4 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/17/2018 4:50:02 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:

31-May-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18051854**

Dear Blaine,

ALS Environmental received 2 samples on 29-May-2018 10:45 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 13.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 31-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18051854**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051854-01	4208	Soil		5/29/2018 09:50	5/29/2018 10:45	☐
18051854-02	4211	Soil		5/29/2018 10:00	5/29/2018 10:45	☐

ALS Group, USA

Date: 31-May-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18051854**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *31-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051854
Sample ID: 4208
Lab ID: 18051854-01
Collection Date: 5/29/2018 09:50 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/30/18 16:31		Analyst: **RSH**
Mercury	**0.19**		**0.023**	**mg/Kg-dry**	1	5/30/2018 04:42 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/29/18 16:06		Analyst: **JF**
Arsenic	**24**		**0.065**	**mg/Kg-dry**	1	5/29/2018 10:36 PM
Barium	**530**		**5.4**	**mg/Kg-dry**	10	5/30/2018 03:23 PM
Beryllium	**1.3**		**0.22**	**mg/Kg-dry**	1	5/29/2018 10:36 PM
Boron	**8.1**		**6.5**	**mg/Kg-dry**	1	5/29/2018 10:36 PM
Cadmium	**0.37**		**0.11**	**mg/Kg-dry**	1	5/29/2018 10:36 PM
Lead	**18**		**0.54**	**mg/Kg-dry**	1	5/29/2018 10:36 PM
Lithium	**5.4**		**0.22**	**mg/Kg-dry**	1	5/29/2018 10:36 PM
Molybdenum	**1.5**		**0.54**	**mg/Kg-dry**	1	5/29/2018 10:36 PM
Selenium	**2.6**		**0.22**	**mg/Kg-dry**	1	5/29/2018 10:36 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**24**		**0.050**	**% of sample**	1	5/29/2018 06:22 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/29/18 18:00		Analyst: **STP**
Sulfate	ND	x	13	mg/Kg-dry	1	5/30/2018 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *31-May-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051854
Sample ID: 4211
Lab ID: 18051854-02
Collection Date: 5/29/2018 10:00 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/30/18 16:31		Analyst: **RSH**
Mercury	**0.038**		**0.022**	**mg/Kg-dry**	1	5/30/2018 04:50 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/29/18 16:06		Analyst: **JF**
Arsenic	**12**		**0.046**	**mg/Kg-dry**	1	5/29/2018 10:38 PM
Barium	**77**		**0.38**	**mg/Kg-dry**	1	5/29/2018 10:38 PM
Beryllium	**0.45**		**0.15**	**mg/Kg-dry**	1	5/29/2018 10:38 PM
Boron	ND		4.6	mg/Kg-dry	1	5/29/2018 10:38 PM
Cadmium	**1.9**		**0.077**	**mg/Kg-dry**	1	5/29/2018 10:38 PM
Lead	**18**		**0.38**	**mg/Kg-dry**	1	5/29/2018 10:38 PM
Lithium	**4.5**		**0.15**	**mg/Kg-dry**	1	5/29/2018 10:38 PM
Molybdenum	**1.9**		**0.38**	**mg/Kg-dry**	1	5/29/2018 10:38 PM
Selenium	**2.3**		**0.15**	**mg/Kg-dry**	1	5/29/2018 10:38 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**11**		**0.050**	**% of sample**	1	5/29/2018 06:22 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/29/18 18:00		Analyst: **STP**
Sulfate	ND	x	11	mg/Kg-dry	1	5/30/2018 10:30 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 31-May-18

Client: Engineering & Environmental Solutions

Work Order: 18051854

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119041** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-119041-119041** Units: **mg/Kg** Analysis Date: **5/30/2018 04:37 PM**

Client ID: Run ID: **HG1_180530A** SeqNo: **5064252** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-119041-119041** Units: **mg/Kg** Analysis Date: **5/30/2018 04:40 PM**

Client ID: Run ID: **HG1_180530A** SeqNo: **5064253** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1767	0.020	0.1665	0	106	80-120	0			

MS Sample ID: **18051854-01AMS** Units: **mg/Kg** Analysis Date: **5/30/2018 04:45 PM**

Client ID: **4208** Run ID: **HG1_180530A** SeqNo: **5064255** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.3569	0.018	0.1489	0.1474	141	75-125	0			SE

MSD Sample ID: **18051854-01AMSD** Units: **mg/Kg** Analysis Date: **5/30/2018 04:47 PM**

Client ID: **4208** Run ID: **HG1_180530A** SeqNo: **5064256** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.3326	0.018	0.1493	0.1474	124	75-125	0.3569	7.06	35	E

The following samples were analyzed in this batch:

18051854-01A	18051854-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051854
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118967** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-118967-118967** Units: **mg/Kg** Analysis Date: **5/29/2018 10:13 PM**
Client ID: Run ID: **ICPMS3_180529A** SeqNo: **5060995** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	0.07855	0.25								J

MBLK Sample ID: **MBLK-118967-118967** Units: **mg/L** Analysis Date: **5/30/2018 03:16 PM**
Client ID: Run ID: **ICPMS3_180530A** SeqNo: **5062305** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	ND	0.10								
Selenium	ND	0.25								

LCS Sample ID: **LCS-118967-118967** Units: **mg/Kg** Analysis Date: **5/29/2018 10:15 PM**
Client ID: Run ID: **ICPMS3_180529A** SeqNo: **5060996** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.065	0.25	5	0	101	80-120	0			
Barium	5.418	0.25	5	0	108	80-120	0			
Beryllium	5.253	0.10	5	0	105	80-120	0			
Cadmium	5.266	0.10	5	0	105	80-120	0			
Lithium	5.464	0.50	5	0	109	80-120	0			

MS Sample ID: **18051769-01AMS** Units: **mg/Kg** Analysis Date: **5/29/2018 10:31 PM**
Client ID: Run ID: **ICPMS3_180529A** SeqNo: **5061005** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	9.872	0.40	8	1.876	100	75-125	0			
Barium	19.3	0.40	8	10.43	111	75-125	0			
Beryllium	8.766	0.16	8	0.1075	108	75-125	0			
Boron	45.47	4.8	40	2.625	107	75-125	0			
Cadmium	8.201	0.16	8	0.03272	102	75-125	0			
Lead	11.83	0.40	8	3.909	99	75-125	0			
Lithium	10.49	0.80	8	1.093	117	75-125	0			
Molybdenum	8.51	0.40	8	0.1331	105	75-125	0			
Selenium	8.88	0.40	8	0.2671	108	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051854
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118967** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18051769-01AMSD** Units: **mg/Kg** Analysis Date: **5/29/2018 10:33 PM**
Client ID: Run ID: **ICPMS3_180529A** SeqNo: **5061006** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.13	0.40	8.026	1.876	103	75-125	9.872	2.54	20	
Barium	18.9	0.40	8.026	10.43	106	75-125	19.3	2.08	20	
Beryllium	8.709	0.16	8.026	0.1075	107	75-125	8.766	0.649	20	
Boron	46.02	4.8	40.13	2.625	108	75-125	45.47	1.18	20	
Cadmium	8.193	0.16	8.026	0.03272	102	75-125	8.201	0.092	20	
Lead	11.79	0.40	8.026	3.909	98.2	75-125	11.83	0.3	20	
Lithium	10.37	0.80	8.026	1.093	116	75-125	10.49	1.13	20	
Molybdenum	8.529	0.40	8.026	0.1331	105	75-125	8.51	0.225	20	
Selenium	8.116	0.40	8.026	0.2671	97.8	75-125	8.88	8.99	20	

The following samples were analyzed in this batch:

18051854-01A	18051854-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051854
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **118992** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-118992-118992** Units: **mg/Kg** Analysis Date: **5/30/2018 10:30 AM**
Client ID: Run ID: **GALLERY_180530A** SeqNo: **5061822** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	3.681	10								Jx

MS Sample ID: **18051674-01A MS** Units: **mg/Kg** Analysis Date: **5/30/2018 10:30 AM**
Client ID: Run ID: **GALLERY_180530A** SeqNo: **5061825** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	8541	89	4464	3734	108	75-125	0			x

MSD Sample ID: **18051674-01A MSD** Units: **mg/Kg** Analysis Date: **5/30/2018 10:30 AM**
Client ID: Run ID: **GALLERY_180530A** SeqNo: **5061826** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	8748	89	4464	3734	112	75-125	8541	2.4	20	x

LCS1 Sample ID: **LCS1-118992-118992** Units: **mg/Kg** Analysis Date: **5/30/2018 10:30 AM**
Client ID: Run ID: **GALLERY_180530A** SeqNo: **5061829** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	99.06	10	100	0	99.1	80-120	0			x

LCS2 Sample ID: **LCS2-118992-118992** Units: **mg/Kg** Analysis Date: **5/30/2018 10:30 AM**
Client ID: Run ID: **GALLERY_180530A** SeqNo: **5061830** Prep Date: **5/29/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	529.9	10	500	0	106	80-120	0			x

The following samples were analyzed in this batch:

18051854-01A	18051854-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051854
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R236876** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R236876** Units: **% of sample** Analysis Date: **5/29/2018 06:22 PM**
Client ID: Run ID: **MOIST_180529B** SeqNo: **5060719** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R236876** Units: **% of sample** Analysis Date: **5/29/2018 06:22 PM**
Client ID: Run ID: **MOIST_180529B** SeqNo: **5060718** 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: **18051769-01A DUP** Units: **% of sample** Analysis Date: **5/29/2018 06:22 PM**
Client ID: Run ID: **MOIST_180529B** SeqNo: **5060710** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	6.2	0.050	0	0	0	0-0	6.33	2.08	10	

DUP Sample ID: **18051790-03B DUP** Units: **% of sample** Analysis Date: **5/29/2018 06:22 PM**
Client ID: Run ID: **MOIST_180529B** SeqNo: **5060715** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	12.92	0.050	0	0	0	0-0	13.16	1.84	10	

The following samples were analyzed in this batch:

18051854-01A	18051854-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39385

ALS Project Manager: | ALS Work Order #: 18051854

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung 14AA	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	EFS	Bill To Company	HBPW	C	
Send Report To	Blaine Litteral, Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax	blaine.litteral@goeesolutions.net	Fax		I	
e-Mail Address	amy.mandrell@goeesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4208	5-29-18	9:50 am	Soil		1	X										
2	4211	5-29-18	10 am	Soil		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☑ 1 BD ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Amy Mandrell	5-29-18	1045	
Relinquished by:	Date: 5/29/18	Time: 1045	Received by (Laboratory):
Logged by (Laboratory):	Date: 5/29/18	Time: 1100	Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp
522	19.8°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **29-May-18 10:45**

Work Order: **18051854** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 29-May-18 (Date) Reviewed by: Bill Carey (eSignature) 29-May-18 (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):	19.8/19.8 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/29/2018 11:01:19 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:

04-Jun-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18051877**

Dear Blaine,

ALS Environmental received 3 samples on 29-May-2018 04:45 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 14.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18051877**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051877-01	4214	Soil		5/29/2018 14:00	5/29/2018 16:45	☐
18051877-02	4172	Soil		5/29/2018 15:00	5/29/2018 16:45	☐
18051877-03	4209	Soil		5/29/2018 16:00	5/29/2018 16:45	☐

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18051877**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051877
Sample ID: 4214
Lab ID: 18051877-01
Collection Date: 5/29/2018 02:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/31/18 10:49		Analyst: **RSH**
Mercury	ND		0.018	mg/Kg-dry	1	5/31/2018 02:31 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/30/18 15:03		Analyst: **JF**
Arsenic	**2.0**		**0.053**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Barium	**11**		**0.44**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/31/2018 01:07 PM
Boron	ND		1.8	mg/Kg-dry	1	6/1/2018 01:28 PM
Cadmium	ND		0.088	mg/Kg-dry	1	5/31/2018 01:07 PM
Lead	**1.2**		**0.44**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Lithium	**3.5**		**0.18**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Molybdenum	**1.6**		**0.44**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
Selenium	**0.31**		**0.088**	**mg/Kg-dry**	1	5/31/2018 01:07 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**17**		**0.050**	**% of sample**	1	5/30/2018 02:20 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/30/18 12:00		Analyst: **STP**
Sulfate	ND		12	mg/Kg-dry	1	5/30/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051877
Sample ID: 4172
Lab ID: 18051877-02
Collection Date: 5/29/2018 03:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/31/18 10:49		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	5/31/2018 02:34 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/30/18 15:03		Analyst: **JF**
Arsenic	**2.1**		**0.054**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Barium	**4.3**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/31/2018 01:09 PM
Boron	**2.0**		**1.8**	**mg/Kg-dry**	1	6/1/2018 01:30 PM
Cadmium	ND		0.089	mg/Kg-dry	1	5/31/2018 01:09 PM
Lead	**0.85**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Lithium	**1.6**		**0.18**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Molybdenum	**2.7**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
Selenium	**1.1**		**0.089**	**mg/Kg-dry**	1	5/31/2018 01:09 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**14**		**0.050**	**% of sample**	1	5/30/2018 02:20 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/30/18 12:00		Analyst: **STP**
Sulfate	ND		12	mg/Kg-dry	1	5/30/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051877
Sample ID: 4209
Lab ID: 18051877-03
Collection Date: 5/29/2018 04:00 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/31/18 10:49		Analyst: **RSH**
Mercury	ND		0.018	mg/Kg-dry	1	5/31/2018 02:36 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/30/18 15:03		Analyst: **JF**
Arsenic	**1.9**		**0.054**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Barium	**6.2**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Beryllium	ND		0.18	mg/Kg-dry	1	5/31/2018 01:11 PM
Boron	ND		1.8	mg/Kg-dry	1	5/31/2018 01:11 PM
Cadmium	ND		0.090	mg/Kg-dry	1	5/31/2018 01:11 PM
Lead	**0.80**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Lithium	**1.5**		**0.18**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Molybdenum	**0.61**		**0.45**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
Selenium	**1.2**		**0.090**	**mg/Kg-dry**	1	5/31/2018 01:11 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**16**		**0.050**	**% of sample**	1	5/30/2018 02:20 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/30/18 12:00		Analyst: **STP**
Sulfate	ND		12	mg/Kg-dry	1	5/30/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions

Work Order: 18051877

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119076** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-119076-119076** Units: **mg/Kg** Analysis Date: **5/31/2018 12:46 PM**

Client ID: Run ID: **HG1_180531A** SeqNo: **5064308** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-119076-119076** Units: **mg/Kg** Analysis Date: **5/31/2018 04:48 PM**

Client ID: Run ID: **HG1_180531A** SeqNo: **5064671** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.185	0.020	0.1665	0	111	80-120	0			

MS Sample ID: **18051478-02BMS** Units: **mg/Kg** Analysis Date: **5/31/2018 01:50 PM**

Client ID: Run ID: **HG1_180531A** SeqNo: **5064329** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1808	0.018	0.1537	0.02814	99.3	75-125	0			

MSD Sample ID: **18051478-02BMSD** Units: **mg/Kg** Analysis Date: **5/31/2018 01:53 PM**

Client ID: Run ID: **HG1_180531A** SeqNo: **5064330** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1769	0.018	0.153	0.02814	97.2	75-125	0.1808	2.18	35	

The following samples were analyzed in this batch:

18051877-01A	18051877-02A	18051877-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051877
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119029** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-119029-119029** Units: **mg/L** Analysis Date: **5/31/2018 12:51 PM**
Client ID: Run ID: **ICPMS3_180531A** SeqNo: **5063766** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.9431	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-119029-119029** Units: **mg/L** Analysis Date: **5/31/2018 12:53 PM**
Client ID: Run ID: **ICPMS3_180531A** SeqNo: **5063767** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.857	0.25	5	0	97.1	80-120	0			
Barium	4.95	0.25	5	0	99	80-120	0			
Beryllium	4.947	0.10	5	0	98.9	80-120	0			
Boron	25.21	1.0	25	0	101	80-120	0			
Cadmium	4.917	0.10	5	0	98.3	80-120	0			
Lead	4.92	0.25	5	0	98.4	80-120	0			
Lithium	5.127	0.50	5	0	103	80-120	0			
Molybdenum	4.982	0.25	5	0	99.6	80-120	0			
Selenium	4.825	0.25	5	0	96.5	80-120	0			

MS Sample ID: **18051718-03BMS** Units: **mg/Kg** Analysis Date: **5/31/2018 01:01 PM**
Client ID: Run ID: **ICPMS3_180531A** SeqNo: **5063772** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	11.25	0.39	7.728	4.001	93.9	75-125	0			
Barium	23.75	0.39	7.728	13.62	131	75-125	0			S
Beryllium	7.753	0.15	7.728	0.1241	98.7	75-125	0			
Boron	43.65	1.5	38.64	5.2	99.5	75-125	0			
Cadmium	6.914	0.15	7.728	0.01667	89.2	75-125	0			
Lead	12.88	0.39	7.728	4.631	107	75-125	0			
Lithium	12.04	0.77	7.728	3.93	105	75-125	0			
Molybdenum	8.083	0.39	7.728	0.8566	93.5	75-125	0			
Selenium	7.274	0.39	7.728	0.6785	85.3	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051877
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119029** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18051718-03BMSD** Units: **mg/Kg** Analysis Date: **5/31/2018 01:03 PM**
Client ID: Run ID: **ICPMS3_180531A** SeqNo: **5063773** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	13.08	0.38	7.68	4.001	118	75-125	11.25	15	20	
Barium	28.4	0.38	7.68	13.62	192	75-125	23.75	17.8	20	S
Beryllium	7.721	0.15	7.68	0.1241	98.9	75-125	7.753	0.406	20	
Boron	45.52	1.5	38.4	5.2	105	75-125	43.65	4.2	20	
Cadmium	6.755	0.15	7.68	0.01667	87.7	75-125	6.914	2.32	20	
Lead	13.32	0.38	7.68	4.631	113	75-125	12.88	3.31	20	
Lithium	13.33	0.77	7.68	3.93	122	75-125	12.04	10.2	20	
Molybdenum	8.174	0.38	7.68	0.8566	95.3	75-125	8.083	1.12	20	
Selenium	7.709	0.38	7.68	0.6785	91.5	75-125	7.274	5.82	20	

The following samples were analyzed in this batch:

18051877-01A	18051877-02A	18051877-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051877
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119027** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-119027-119027** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180530D** SeqNo: **5061965** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	ND	10								

MS Sample ID: **18051877-01AMS** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: **4214** Run ID: **GALLERY_180530D** SeqNo: **5061967** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	510.1	10	500	5.234	101	75-125	0			

MSD Sample ID: **18051877-01AMSD** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: **4214** Run ID: **GALLERY_180530D** SeqNo: **5061968** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	529.3	10	500	5.234	105	75-125	510.1	3.69	20	

LCS1 Sample ID: **LCS1-119027-119027** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180530D** SeqNo: **5061971** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	105.1	10	100	0	105	80-120	0			

LCS2 Sample ID: **LCS2-119027-119027** Units: **mg/Kg** Analysis Date: **5/30/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180530D** SeqNo: **5061972** Prep Date: **5/30/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	533.1	10	500	0	107	80-120	0			

The following samples were analyzed in this batch:

18051877-01A	18051877-02A	18051877-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051877
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R236972** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R236972** Units: **% of sample** Analysis Date: **5/30/2018 02:20 PM**
Client ID: Run ID: **MOIST_180530A** SeqNo: **5062687** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R236972** Units: **% of sample** Analysis Date: **5/30/2018 02:20 PM**
Client ID: Run ID: **MOIST_180530A** SeqNo: **5062685** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.99	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **18051877-01A DUP** Units: **% of sample** Analysis Date: **5/30/2018 02:20 PM**
Client ID: **4214** Run ID: **MOIST_180530A** SeqNo: **5062666** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.01	0.050	0	0	0	0-0	16.87	0.826	10	

DUP Sample ID: **18051888-01B DUP** Units: **% of sample** Analysis Date: **5/30/2018 02:20 PM**
Client ID: Run ID: **MOIST_180530A** SeqNo: **5062670** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	19.65	0.050	0	0	0	0-0	20.28	3.16	10	

The following samples were analyzed in this batch:

18051877-01A	18051877-02A	18051877-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 40808

ALS Project Manager: | ALS Work Order #: 1805877

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CYAP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	EES	Bill To Company	HBPW	C	
Send Report To	Blaine Litteral, Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	Blaine.Litteral@eesolutions.net amy.mandrell@eesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Preserv.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4214	5.29.18	2pm	Soil		1	X										
2	4172	↓	3pm	↓		1	X										
3	4209		4pm			1	X										
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: AMY Mandrell AMY Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 5.29.18	Time: 1645	Received by:	
Relinquished by:	Date: 5/29/18	Time: 1645	Received by (Laboratory):	
Logged by (Laboratory): DES	Date: 5/30/18	Time: 0830	Checked by (Laboratory):	

Notes:

Cooler ID	Cooler Temp
502	13.6°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **29-May-18 16:45**

Work Order: **18051877** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 30-May-18 (Date) Reviewed by: Bill Carey (eSignature) 30-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	13.6/13.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/30/2018 9:10:36 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:

04-Jun-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **18051974**

Dear Blaine,

ALS Environmental received 2 samples on 31-May-2018 08:27 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 13.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **18051974**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051974-01	4204	Soil		5/30/2018 16:20	5/31/2018 08:27	☐
18051974-02	4169	Soil		5/30/2018 15:50	5/31/2018 08:27	☐

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **18051974**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051974
Sample ID: 4204
Lab ID: 18051974-01
Collection Date: 5/30/2018 04:20 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 6/1/18 13:45		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	6/1/2018 01:47 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/31/18 15:47		Analyst: **RH**
Arsenic	**1.1**		**0.056**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
Barium	**11**		**0.47**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
Beryllium	ND		0.19	mg/Kg-dry	1	6/1/2018 10:11 PM
Boron	ND		1.9	mg/Kg-dry	1	6/1/2018 10:11 PM
Cadmium	ND		0.093	mg/Kg-dry	1	6/1/2018 10:11 PM
Lead	**1.3**		**0.47**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
Lithium	**2.5**		**0.19**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
Molybdenum	ND		0.47	mg/Kg-dry	1	6/1/2018 10:11 PM
Selenium	**0.37**		**0.093**	**mg/Kg-dry**	1	6/1/2018 10:11 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**16**		**0.050**	**% of sample**	1	5/31/2018 01:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 6/1/18 13:55		Analyst: **STP**
Sulfate	**43**	x	**11**	**mg/Kg-dry**	1	6/1/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 18051974
Sample ID: 4169
Lab ID: 18051974-02
Collection Date: 5/30/2018 03:50 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 6/1/18 13:45		Analyst: **RSH**
Mercury	ND		0.022	mg/Kg-dry	1	6/1/2018 01:50 PM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/31/18 15:47		Analyst: **RH**
Arsenic	**0.86**		**0.053**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Barium	**3.3**		**0.44**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Beryllium	ND		0.18	mg/Kg-dry	1	6/1/2018 10:12 PM
Boron	ND		1.8	mg/Kg-dry	1	6/1/2018 10:12 PM
Cadmium	ND		0.088	mg/Kg-dry	1	6/1/2018 10:12 PM
Lead	**1.1**		**0.44**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Lithium	**1.3**		**0.18**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Molybdenum	**1.1**		**0.44**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
Selenium	**2.4**		**0.088**	**mg/Kg-dry**	1	6/1/2018 10:12 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**11**		**0.050**	**% of sample**	1	5/31/2018 01:00 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 6/1/18 13:55		Analyst: **STP**
Sulfate	**14**	x	**11**	**mg/Kg-dry**	1	6/1/2018 02:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions

Work Order: 18051974

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119173** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-119173-119173** Units: **mg/Kg** Analysis Date: **6/1/2018 01:42 PM**

Client ID: Run ID: **HG1_180601A** SeqNo: **5067296** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-119173-119173** Units: **mg/Kg** Analysis Date: **6/1/2018 01:45 PM**

Client ID: Run ID: **HG1_180601A** SeqNo: **5067299** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1733	0.020	0.1665	0	104	80-120	0			

MS Sample ID: **18051930-03BMS** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**

Client ID: Run ID: **HG1_180601A** SeqNo: **5067317** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1487	0.017	0.1401	0.01827	93.1	75-125	0			

MSD Sample ID: **18051930-03BMSD** Units: **mg/Kg** Analysis Date: **6/1/2018 02:03 PM**

Client ID: Run ID: **HG1_180601A** SeqNo: **5067324** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1487	0.017	0.1415	0.01827	92.2	75-125	0.1487	0.0387	35	

The following samples were analyzed in this batch:

18051974-01A	18051974-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051974
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119096** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-119096-119096** Units: **mg/Kg** Analysis Date: **6/1/2018 09:18 PM**
Client ID: Run ID: **ICPMS3_180601A** SeqNo: **5069204** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.07935	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-119096-119096** Units: **mg/Kg** Analysis Date: **6/1/2018 09:20 PM**
Client ID: Run ID: **ICPMS3_180601A** SeqNo: **5069205** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5	0.25	5	0	100	80-120	0			
Barium	5.01	0.25	5	0	100	80-120	0			
Beryllium	4.88	0.10	5	0	97.6	80-120	0			
Boron	25.01	1.0	25	0	100	80-120	0			
Cadmium	5.047	0.10	5	0	101	80-120	0			
Lead	5.025	0.25	5	0	101	80-120	0			
Lithium	5.144	0.50	5	0	103	80-120	0			
Molybdenum	5.198	0.25	5	0	104	80-120	0			
Selenium	4.959	0.25	5	0	99.2	80-120	0			

MS Sample ID: **18051774-08AMS** Units: **mg/Kg** Analysis Date: **6/1/2018 09:52 PM**
Client ID: Run ID: **ICPMS3_180601A** SeqNo: **5069223** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	15.67	0.41	8.117	9.414	77.1	75-125	0			
Barium	101	0.41	8.117	92.08	110	75-125	0			O
Beryllium	6.7	0.16	8.117	0.4306	77.2	75-125	0			
Boron	37.08	1.6	40.58	4.571	80.1	75-125	0			
Cadmium	8.374	0.16	8.117	2.159	76.6	75-125	0			
Lithium	13.38	0.81	8.117	4.43	110	75-125	0			
Molybdenum	7.897	0.41	8.117	1.337	80.8	75-125	0			
Selenium	7.254	0.41	8.117	1.148	75.2	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051974
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119096** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **18051774-08AMSD** Units: **mg/Kg** Analysis Date: **6/1/2018 09:54 PM**
Client ID: Run ID: **ICPMS3_180601A** SeqNo: **5069224** Prep Date: **5/31/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	15.88	0.40	8.078	9.414	80.1	75-125	15.67	1.36	20	
Barium	99.09	0.40	8.078	92.08	86.8	75-125	101	1.93	20	O
Beryllium	6.717	0.16	8.078	0.4306	77.8	75-125	6.7	0.252	20	
Boron	37.45	1.6	40.39	4.571	81.4	75-125	37.08	0.988	20	
Cadmium	8.32	0.16	8.078	2.159	76.3	75-125	8.374	0.647	20	
Lithium	13.27	0.81	8.078	4.43	109	75-125	13.38	0.834	20	
Molybdenum	7.915	0.40	8.078	1.337	81.4	75-125	7.897	0.227	20	
Selenium	7.821	0.40	8.078	1.148	82.6	75-125	7.254	7.53	20	

The following samples were analyzed in this batch: 18051974-01A 18051974-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051974
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119172** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-119172-119172** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180601A** SeqNo: **5067171** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	4.123	10								Jx

MS Sample ID: **18051974-02AMS** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: **4169** Run ID: **GALLERY_180601A** SeqNo: **5067174** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	485.3	9.3	463	12.08	102	75-125	0			x

MSD Sample ID: **18051974-02AMSD** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: **4169** Run ID: **GALLERY_180601A** SeqNo: **5067175** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	532	10	498	12.08	104	75-125	485.3	9.18	20	x

LCS1 Sample ID: **LCS1-119172-119172** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180601A** SeqNo: **5067176** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	102	10	100	0	102	80-120	0			x

LCS2 Sample ID: **LCS2-119172-119172** Units: **mg/Kg** Analysis Date: **6/1/2018 02:00 PM**
Client ID: Run ID: **GALLERY_180601A** SeqNo: **5067177** Prep Date: **6/1/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	538.6	10	500	0	108	80-120	0			x

The following samples were analyzed in this batch:

18051974-01A	18051974-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 18051974
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R237090** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R237090** Units: **% of sample** Analysis Date: **5/31/2018 01:00 PM**
Client ID: Run ID: **MOIST_180531A** SeqNo: **5065316** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R237090** Units: **% of sample** Analysis Date: **5/31/2018 01:00 PM**
Client ID: Run ID: **MOIST_180531A** SeqNo: **5065315** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.99	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **18051974-01A DUP** Units: **% of sample** Analysis Date: **5/31/2018 01:00 PM**
Client ID: **4204** Run ID: **MOIST_180531A** SeqNo: **5065300** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.76	0.050	0	0	0	0-0	15.59	1.08	10	

DUP Sample ID: **18052001-01A DUP** Units: **% of sample** Analysis Date: **5/31/2018 01:00 PM**
Client ID: Run ID: **MOIST_180531A** SeqNo: **5065314** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.21	0.050	0	0	0	0-0	13.91	2.13	10	

The following samples were analyzed in this batch:

18051974-01A	18051974-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 40809

ALS Project Manager: | ALS Work Order #: 1805197

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CAAP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	EES	Bill To Company	HBPW	C	
Send Report To	Blaine Litteral + Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax	blaine.litteral@geosolutions.net	Fax		I	
e-Mail Address	amy.mandrell@geosolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4204	5/30/18	4:20	Soil		1	X										
2	4/09	5/30/18	3:50	Soil		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell amy mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell — Date: 5/30/18 — Time:

Received by:

Relinquished by: — Date: 5/31/18 — Time: 0827

Received by (Laboratory):

Logged by (Laboratory): DES — Date: 5/31/18 — Time: 0830

Checked by (Laboratory):

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Notes:

Cooler ID	Cooler Temp
SR2	10.6°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **31-May-18 08:27**

Work Order: **18051974** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 31-May-18 (Date) Reviewed by: Bill Carey (eSignature) 31-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	10.6/10.6 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/31/2018 8:29:31 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:

04-Jun-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung (133-17-001)** Work Order: **18051589**

Dear Blaine, Revision: **1**

ALS Environmental received 2 samples on 23-May-2018 05:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 16.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung (133-17-001)
Work Order: **18051589**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
18051589-01	4224	Soil		5/23/2018 12:30	5/23/2018 17:00	☐
18051589-02	4220	Soil		5/23/2018 16:20	5/23/2018 17:00	☐

ALS Group, USA

Date: 04-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung (133-17-001)
WorkOrder: **18051589**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung (133-17-001) **Work Order:** 18051589
Sample ID: 4224 **Lab ID:** 18051589-01
Collection Date: 5/23/2018 12:30 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/24/18 11:32		Analyst: **RSH**
Mercury	ND		0.019	mg/Kg-dry	1	5/24/2018 11:56 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/24/18 15:14		Analyst: **JF**
Arsenic	**1.5**		**0.051**	**mg/Kg-dry**	1	5/24/2018 11:28 PM
Barium	**6.7**		**0.42**	**mg/Kg-dry**	1	5/24/2018 11:28 PM
Beryllium	ND		0.17	mg/Kg-dry	1	5/24/2018 11:28 PM
Boron	ND		1.7	mg/Kg-dry	1	5/24/2018 11:28 PM
Cadmium	ND		0.085	mg/Kg-dry	1	5/24/2018 11:28 PM
Lead	**3.8**		**0.42**	**mg/Kg-dry**	1	5/24/2018 11:28 PM
Lithium	**2.6**		**0.17**	**mg/Kg-dry**	1	5/24/2018 11:28 PM
Molybdenum	**0.90**		**0.42**	**mg/Kg-dry**	1	5/24/2018 11:28 PM
Selenium	**0.40**		**0.085**	**mg/Kg-dry**	1	5/24/2018 11:28 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**17**		**0.050**	**% of sample**	1	5/24/2018 10:45 AM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/24/18 12:20		Analyst: **STP**
Sulfate	ND	x	12	mg/Kg-dry	1	5/24/2018 12:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group, USA

Date: *04-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung (133-17-001) **Work Order:** 18051589
Sample ID: 4220 **Lab ID:** 18051589-02
Collection Date: 5/23/2018 04:20 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA (SPLP)			**SW7470A**	Prep: SW7470 6/4/18 11:50		Analyst: **RSH**
Mercury	ND		0.00020	mg/L	1	6/4/2018 01:09 PM
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 5/24/18 11:32		Analyst: **RSH**
Mercury	**0.16**		**0.024**	**mg/Kg-dry**	1	5/24/2018 11:58 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 5/24/18 15:14		Analyst: **JF**
Arsenic	**4.2**		**0.067**	**mg/Kg-dry**	1	5/24/2018 11:30 PM
Barium	**73**		**0.56**	**mg/Kg-dry**	1	5/24/2018 11:30 PM
Beryllium	**0.36**		**0.22**	**mg/Kg-dry**	1	5/24/2018 11:30 PM
Boron	**8.7**		**2.2**	**mg/Kg-dry**	1	5/24/2018 11:30 PM
Cadmium	**0.75**		**0.11**	**mg/Kg-dry**	1	5/24/2018 11:30 PM
Lead	**24**		**0.56**	**mg/Kg-dry**	1	5/24/2018 11:30 PM
Lithium	**9.2**		**0.22**	**mg/Kg-dry**	1	5/24/2018 11:30 PM
Molybdenum	ND		0.56	mg/Kg-dry	1	5/24/2018 11:30 PM
Selenium	**1.9**		**0.11**	**mg/Kg-dry**	1	5/24/2018 11:30 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**28**		**0.050**	**% of sample**	1	5/24/2018 10:45 AM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 5/24/18 12:20		Analyst: **STP**
Sulfate	ND	x	13	mg/Kg-dry	1	5/24/2018 12:30 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

QC BATCH REPORT

Batch ID: **118805** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-118805-118805** Units: **mg/Kg** Analysis Date: **5/24/2018 11:51 AM**

Client ID: Run ID: **HG1_180524A** SeqNo: **5053426** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS Sample ID: **LCS-118805-118805** Units: **mg/Kg** Analysis Date: **5/24/2018 11:53 AM**

Client ID: Run ID: **HG1_180524A** SeqNo: **5053427** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1608	0.020	0.1665	0	96.6	80-120	0			

MS Sample ID: **18051589-02AMS** Units: **mg/Kg** Analysis Date: **5/24/2018 12:01 PM**

Client ID: **4220** Run ID: **HG1_180524A** SeqNo: **5053430** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.2306	0.018	0.1463	0.1082	83.7	75-125	0			

MSD Sample ID: **18051589-02AMSD** Units: **mg/Kg** Analysis Date: **5/24/2018 12:03 PM**

Client ID: **4220** Run ID: **HG1_180524A** SeqNo: **5053431** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.2234	0.018	0.1478	0.1082	77.9	75-125	0.2262	1.26	35	

The following samples were analyzed in this batch:

18051589-01A	18051589-02A

Client: Engineering & Environmental Solutions
Work Order: 18051589
Project: James DeYoung (133-17-001)

QC BATCH REPORT

Batch ID: **119231** Instrument ID **HG1** Method: **SW7470A**

MBLK Sample ID: **MBLK-119231-119231** Units: **mg/L** Analysis Date: **6/4/2018 01:04 PM**
Client ID: Run ID: **HG1_180604A** SeqNo: **5070675** Prep Date: **6/4/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS Sample ID: **LCS-119231-119231** Units: **mg/L** Analysis Date: **6/4/2018 01:06 PM**
Client ID: Run ID: **HG1_180604A** SeqNo: **5070676** Prep Date: **6/4/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00206	0.00020	0.002	0	103	80-120	0			

MS Sample ID: **18051713-11BMS** Units: **mg/L** Analysis Date: **6/4/2018 02:10 PM**
Client ID: Run ID: **HG1_180604A** SeqNo: **5070833** Prep Date: **6/4/2018** 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	0.000003	100	75-125	0			

MSD Sample ID: **18051713-11BMSD** Units: **mg/L** Analysis Date: **6/4/2018 02:13 PM**
Client ID: Run ID: **HG1_180604A** SeqNo: **5070834** Prep Date: **6/4/2018** 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	0.000003	93.8	75-125	0.00201	6.68	20	

The following samples were analyzed in this batch: 18051589-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

QC BATCH REPORT

Batch ID: **118827** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-118827-118827** Units: **mg/L** Analysis Date: **5/24/2018 10:41 PM**
Client ID: Run ID: **ICPMS3_180524A** SeqNo: **5054488** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	0.08685	0.50								J
Molybdenum	ND	0.25								
Selenium	ND	0.25								

MBLK Sample ID: **MBLK-118827-118827** Units: **mg/Kg** Analysis Date: **5/25/2018 02:14 PM**
Client ID: Run ID: **ICPMS3_180525A** SeqNo: **5057606** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Boron	0.1866	1.0								J

LCS Sample ID: **LCS-118827-118827** Units: **mg/L** Analysis Date: **5/24/2018 10:43 PM**
Client ID: Run ID: **ICPMS3_180524A** SeqNo: **5054489** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.701	0.25	5	0	94	80-120	0			
Barium	5.186	0.25	5	0	104	80-120	0			
Boron	20.62	1.0	25	0	82.5	80-120	0			B
Cadmium	4.87	0.10	5	0	97.4	80-120	0			
Lead	4.827	0.25	5	0	96.5	80-120	0			
Lithium	4.706	0.50	5	0	94.1	80-120	0			
Molybdenum	4.768	0.25	5	0	95.4	80-120	0			
Selenium	4.655	0.25	5	0	93.1	80-120	0			

LCS Sample ID: **LCS-118827-118827** Units: **mg/Kg** Analysis Date: **5/25/2018 02:16 PM**
Client ID: Run ID: **ICPMS3_180525A** SeqNo: **5057607** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	4.773	0.10	5	0	95.5	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18051589
Project: James DeYoung (133-17-001)

QC BATCH REPORT

Batch ID: **118827** Instrument ID **ICPMS3** Method: **SW6020A**

MS Sample ID: **18051589-02AMS** Units: **mg/Kg** Analysis Date: **5/24/2018 11:32 PM**
Client ID: **4220** Run ID: **ICPMS3_180524A** SeqNo: **5054516** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.3	0.40	8.026	3.022	90.7	75-125	0			
Barium	70.46	0.40	8.026	52.78	220	75-125	0			SO
Beryllium	7.676	0.16	8.026	0.2618	92.4	75-125	0			
Boron	40.04	1.6	40.13	6.235	84.2	75-125	0			
Cadmium	7.378	0.16	8.026	0.5382	85.2	75-125	0			
Lead	24.69	0.40	8.026	17.54	89.1	75-125	0			
Lithium	18.62	0.80	8.026	6.63	149	75-125	0			S
Molybdenum	7.409	0.40	8.026	0.3988	87.4	75-125	0			
Selenium	8.569	0.40	8.026	1.386	89.5	75-125	0			

MSD Sample ID: **18051589-02AMSD** Units: **mg/Kg** Analysis Date: **5/24/2018 11:34 PM**
Client ID: **4220** Run ID: **ICPMS3_180524A** SeqNo: **5054517** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	10.28	0.40	8.013	3.022	90.6	75-125	10.3	0.223	20	
Barium	63.29	0.40	8.013	52.78	131	75-125	70.46	10.7	20	SO
Beryllium	7.715	0.16	8.013	0.2618	93	75-125	7.676	0.503	20	
Boron	40.64	1.6	40.06	6.235	85.9	75-125	40.04	1.49	20	
Cadmium	7.587	0.16	8.013	0.5382	88	75-125	7.378	2.79	20	
Lead	24.99	0.40	8.013	17.54	93	75-125	24.69	1.2	20	
Lithium	16.76	0.80	8.013	6.63	126	75-125	18.62	10.5	20	S
Molybdenum	7.417	0.40	8.013	0.3988	87.6	75-125	7.409	0.105	20	
Selenium	8.221	0.40	8.013	1.386	85.3	75-125	8.569	4.15	20	

The following samples were analyzed in this batch:

18051589-01A	18051589-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18051589
Project: James DeYoung (133-17-001)

QC BATCH REPORT

Batch ID: **118809** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-118809-118809** Units: **mg/Kg** Analysis Date: **5/24/2018 12:30 PM**
Client ID: Run ID: **GALLERY_180524A** SeqNo: **5050766** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	3.731	10								Jx

MS Sample ID: **18051589-01AMS** Units: **mg/Kg** Analysis Date: **5/24/2018 12:30 PM**
Client ID: **4224** Run ID: **GALLERY_180524A** SeqNo: **5050768** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	502.8	9.9	496	3.64	101	75-125	0			x

MSD Sample ID: **18051589-01AMSD** Units: **mg/Kg** Analysis Date: **5/24/2018 12:30 PM**
Client ID: **4224** Run ID: **GALLERY_180524A** SeqNo: **5050769** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	521.8	9.9	496	3.64	104	75-125	502.8	3.72	20	x

LCS1 Sample ID: **LCS1-118809-118809** Units: **mg/Kg** Analysis Date: **5/24/2018 12:30 PM**
Client ID: Run ID: **GALLERY_180524A** SeqNo: **5050771** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	104.2	10	100	0	104	80-120	0			x

LCS2 Sample ID: **LCS2-118809-118809** Units: **mg/Kg** Analysis Date: **5/24/2018 12:30 PM**
Client ID: Run ID: **GALLERY_180524A** SeqNo: **5050772** Prep Date: **5/24/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	540.1	10	500	0	108	80-120	0			x

The following samples were analyzed in this batch:

18051589-01A	18051589-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Engineering & Environmental Solutions
Work Order: 18051589
Project: James DeYoung (133-17-001)

QC BATCH REPORT

Batch ID: **R236583** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **MB-R236583-R236583** Units: **% of sample** Analysis Date: **5/24/2018 10:45 AM**
Client ID: Run ID: **MOIST_180524A** SeqNo: **5053590** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R236583-R236583** Units: **% of sample** Analysis Date: **5/24/2018 10:45 AM**
Client ID: Run ID: **MOIST_180524A** SeqNo: **5053591** 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: **18051589-01A DUP** Units: **% of sample** Analysis Date: **5/24/2018 10:45 AM**
Client ID: **4224** Run ID: **MOIST_180524A** SeqNo: **5053593** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	16.64	0.050	0	0	0	0-0	17.3	3.89	10	

The following samples were analyzed in this batch:

18051589-01A	18051589-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Cincinnati, OH +1 513 733 5336
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Everett, WA +1 425 356 2600
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Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 39386

ALS Project Manager: | ALS Work Order #: 1805189

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung Park	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	EES	Bill To Company	HBPW	C	
Send Report To		Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 600 Suite 8	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address	diane.liberal@eesolutions.net amy.mandrell@eesolutions.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Preserv.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4224	5/23/18	12:30	Soil		1	X										
2	4220	5/23/18	4:20	Soil		1	X										
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☒ 1 BD ☐ Other ____

Results Due Date:

Relinquished by: Amy Mandrell	Date: 5.22.18	Time:	Received by:	Notes:	
Relinquished by:	Date:	Time: 1700	Received by (Laboratory):	Cooler ID: Sp 2	Cooler Temp: 14.0c
Logged by (Laboratory): DES	Date: 5/24/18	Time: 0830	Checked by (Laboratory):		

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other ____

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **23-May-18 17:00**

Work Order: **18051589** Received by: **PD**

Checklist completed by Diane Shaw (eSignature) 24-May-18 (Date) Reviewed by: Tom Bramish (eSignature) 24-May-18 (Date)

Matrices: Soil

Carrier name: Client

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):	14.0/14.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/24/2018 8:36:16 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:

Bill Carey

From: Amy Mandrell <amy.mandrell@goeesolutions.net>
Sent: Wednesday, May 30, 2018 1:31 PM
To: Bill Carey
Subject: RE: 18051589 James DeYoung (133-17-001)

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Bill,

Correction to my last e-mail – we just need a mercury SPLP on 4220.

Thanks!
Amy Mandrell

From: Amy Mandrell <amy.mandrell@goeesolutions.net>
Sent: Wednesday, May 30, 2018 1:28 PM
To: 'Bill Carey' <Bill.Carey@ALSGlobal.com>
Subject: RE: 18051589 James DeYoung (133-17-001)

Hi Bill,

Could you run SPLP for mercury on both of these?

Thanks!

Amy Mandrell

From: Bill Carey <Bill.Carey@ALSGlobal.com>
Sent: Friday, May 25, 2018 11:23 AM
To: amy.mandrell@goeesolutions.net; blaine.litteral@goeesolutions.net
Cc: 'jvisscher@hollandbpw.com' <jvisscher@hollandbpw.com>
Subject: 18051589 James DeYoung (133-17-001)

Results of the analyses for the samples we received are attached. The project invoice is also 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, Environmental
Holland Laboratory

T +1 616 399 6070 **D** +1 616 738 7309
F +1 616 399 6185 **M** +1 616 510 3267
bill.carey@alsglobal.com
3352 128th Avenue
Holland, Michigan 49424

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05-Jun-2018

Blaine Litteral, P.E.
Engineering & Environmental Solutions
400 136th Ave
Bldg 100, Suite B
Holland, MI 49424

Re: **James DeYoung CYAP** Work Order: **1806095**

Dear Blaine,

ALS Environmental received 1 sample on 01-Jun-2018 03:50 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 12.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 998501

ALS Group, USA

Date: 05-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: **1806095**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1806095-01	4201	Soil		6/1/2018 14:30	6/1/2018 15:50	☐

ALS Group, USA

Date: 05-Jun-18

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
WorkOrder: **1806095**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-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
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 Reporting Limit, 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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Date: *05-Jun-18*

Client: Engineering & Environmental Solutions
Project: James DeYoung CYAP
Work Order: 1806095
Sample ID: 4201
Lab ID: 1806095-01
Collection Date: 6/1/2018 02:30 PM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7471B**	Prep: SW7471 6/5/18 07:40		Analyst: **RSH**
Mercury	ND		0.021	mg/Kg-dry	1	6/5/2018 08:15 AM
METALS BY ICP-MS			**SW6020A**	Prep: SW3050B 6/3/18 13:26		Analyst: **JF**
Arsenic	**0.75**		**0.048**	**mg/Kg-dry**	1	6/4/2018 02:01 PM
Barium	**7.4**		**0.40**	**mg/Kg-dry**	1	6/4/2018 02:01 PM
Beryllium	ND		0.16	mg/Kg-dry	1	6/4/2018 02:01 PM
Boron	**1.9**		**1.6**	**mg/Kg-dry**	1	6/4/2018 02:01 PM
Cadmium	ND		0.080	mg/Kg-dry	1	6/4/2018 02:01 PM
Lead	**0.92**		**0.40**	**mg/Kg-dry**	1	6/4/2018 02:01 PM
Lithium	**4.2**		**0.16**	**mg/Kg-dry**	1	6/4/2018 02:01 PM
Molybdenum	ND		0.40	mg/Kg-dry	1	6/4/2018 02:01 PM
Selenium	**0.51**		**0.080**	**mg/Kg-dry**	1	6/4/2018 02:01 PM
MOISTURE			**SW3550C**			Analyst: **NW**
Moisture	**14**		**0.050**	**% of sample**	1	6/1/2018 07:50 PM
SULFATE			**A4500-SO4 E-11**	Prep: EXTRACT 6/4/18 12:58		Analyst: **STP**
Sulfate	**34**	x	**11**	**mg/Kg-dry**	1	6/4/2018 01:00 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 05-Jun-18

Client: Engineering & Environmental Solutions

Work Order: 1806095

Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119256** Instrument ID **HG1** Method: **SW7471B**

MBLK	Sample ID: **MBLK-119256-119256**				Units: **mg/Kg**			Analysis Date: **6/5/2018 08:10 AM**			
Client ID:	Run ID: **HG1_180605A**				SeqNo: **5072444**			Prep Date: **6/5/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.020								

LCS	Sample ID: **LCS-119256-119256**				Units: **mg/Kg**			Analysis Date: **6/5/2018 08:13 AM**			
Client ID:	Run ID: **HG1_180605A**				SeqNo: **5072445**			Prep Date: **6/5/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.175	0.020	0.1665	0	105	80-120	0			

MS	Sample ID: **18052001-01AMS**				Units: **mg/Kg**			Analysis Date: **6/5/2018 08:20 AM**			
Client ID:	Run ID: **HG1_180605A**				SeqNo: **5072448**			Prep Date: **6/5/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1536	0.018	0.1505	0.006822	97.6	75-125	0			

MSD	Sample ID: **18052001-01AMSD**				Units: **mg/Kg**			Analysis Date: **6/5/2018 08:23 AM**			
Client ID:	Run ID: **HG1_180605A**				SeqNo: **5072449**			Prep Date: **6/5/2018**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1637	0.018	0.1507	0.006822	104	75-125	0.1536	6.33	35	

The following samples were analyzed in this batch: 1806095-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1806095
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119201** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK Sample ID: **MBLK-119201-119201** Units: **mg/Kg** Analysis Date: **6/4/2018 01:57 PM**
Client ID: Run ID: **ICPMS3_180604A** SeqNo: **5070909** Prep Date: **6/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Beryllium	ND	0.10								
Boron	0.2516	1.0								J
Cadmium	ND	0.10								
Lead	ND	0.25								
Lithium	ND	0.50								
Molybdenum	ND	0.25								
Selenium	ND	0.25								

LCS Sample ID: **LCS-119201-119201** Units: **mg/Kg** Analysis Date: **6/4/2018 01:59 PM**
Client ID: Run ID: **ICPMS3_180604A** SeqNo: **5070910** Prep Date: **6/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.519	0.25	5	0	90.4	80-120	0			
Barium	4.618	0.25	5	0	92.4	80-120	0			
Beryllium	4.528	0.10	5	0	90.6	80-120	0			
Boron	22.36	1.0	25	0	89.4	80-120	0			
Cadmium	4.622	0.10	5	0	92.4	80-120	0			
Lead	4.643	0.25	5	0	92.9	80-120	0			
Lithium	4.78	0.50	5	0	95.6	80-120	0			
Molybdenum	4.735	0.25	5	0	94.7	80-120	0			
Selenium	4.43	0.25	5	0	88.6	80-120	0			

MS Sample ID: **1806095-01AMS** Units: **mg/Kg** Analysis Date: **6/4/2018 02:02 PM**
Client ID: **4201** Run ID: **ICPMS3_180604A** SeqNo: **5070912** Prep Date: **6/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	7.135	0.34	6.859	0.6436	94.7	75-125	0			
Barium	13.71	0.34	6.859	6.37	107	75-125	0			
Beryllium	6.528	0.14	6.859	0.04371	94.5	75-125	0			
Boron	33.44	1.4	34.29	1.658	92.7	75-125	0			
Cadmium	6.449	0.14	6.859	0.007387	93.9	75-125	0			
Lead	7.354	0.34	6.859	0.7854	95.8	75-125	0			
Lithium	10.64	0.69	6.859	3.61	103	75-125	0			
Molybdenum	6.823	0.34	6.859	0.2333	96.1	75-125	0			
Selenium	7.016	0.34	6.859	0.4415	95.9	75-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1806095
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119201** Instrument ID **ICPMS3** Method: **SW6020A**

MSD Sample ID: **1806095-01AMSD** Units: **mg/Kg** Analysis Date: **6/4/2018 02:04 PM**
Client ID: **4201** Run ID: **ICPMS3_180604A** SeqNo: **5070913** Prep Date: **6/3/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	7.306	0.34	6.859	0.6436	97.1	75-125	7.135	2.36	20	
Barium	14.18	0.34	6.859	6.37	114	75-125	13.71	3.36	20	
Beryllium	6.69	0.14	6.859	0.04371	96.9	75-125	6.528	2.44	20	
Boron	34.98	1.4	34.29	1.658	97.2	75-125	33.44	4.5	20	
Cadmium	6.696	0.14	6.859	0.007387	97.5	75-125	6.449	3.76	20	
Lead	7.637	0.34	6.859	0.7854	99.9	75-125	7.354	3.77	20	
Lithium	11.1	0.69	6.859	3.61	109	75-125	10.64	4.23	20	
Molybdenum	7.092	0.34	6.859	0.2333	100	75-125	6.823	3.88	20	
Selenium	7.044	0.34	6.859	0.4415	96.3	75-125	7.016	0.397	20	

The following samples were analyzed in this batch: 1806095-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1806095
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **119239** Instrument ID **GALLERY** Method: **A4500-SO4 E-11**

MBLK Sample ID: **MBLK-119239-119239** Units: **mg/Kg** Analysis Date: **6/4/2018 01:00 PM**
Client ID: Run ID: **GALLERY_180604B** SeqNo: **5070865** Prep Date: **6/4/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	2.851	10								Jx

MS Sample ID: **1806095-01AMS** Units: **mg/Kg** Analysis Date: **6/4/2018 01:00 PM**
Client ID: **4201** Run ID: **GALLERY_180604B** SeqNo: **5070867** Prep Date: **6/4/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	489.8	9.3	467.3	29.13	98.6	75-125	0			x

MSD Sample ID: **1806095-01AMSD** Units: **mg/Kg** Analysis Date: **6/4/2018 01:00 PM**
Client ID: **4201** Run ID: **GALLERY_180604B** SeqNo: **5070868** Prep Date: **6/4/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	519.8	9.5	476.2	29.13	103	75-125	489.8	5.94	20	x

LCS1 Sample ID: **LCS1-119239-119239** Units: **mg/Kg** Analysis Date: **6/4/2018 01:00 PM**
Client ID: Run ID: **GALLERY_180604B** SeqNo: **5070869** Prep Date: **6/4/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	106.9	10	100	0	107	80-120	0			x

LCS2 Sample ID: **LCS2-119239-119239** Units: **mg/Kg** Analysis Date: **6/4/2018 01:00 PM**
Client ID: Run ID: **GALLERY_180604B** SeqNo: **5070870** Prep Date: **6/4/2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfate	535.7	10	500	0	107	80-120	0			x

The following samples were analyzed in this batch: 1806095-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Engineering & Environmental Solutions
Work Order: 1806095
Project: James DeYoung CYAP

QC BATCH REPORT

Batch ID: **R237207** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R237207** Units: **% of sample** Analysis Date: **6/1/2018 07:50 PM**
Client ID: Run ID: **MOIST_180601G** SeqNo: **5068125** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	0.03	0.050								J

LCS Sample ID: **LCS-R237207** Units: **% of sample** Analysis Date: **6/1/2018 07:50 PM**
Client ID: Run ID: **MOIST_180601G** SeqNo: **5068124** 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: **18051774-19A DUP** Units: **% of sample** Analysis Date: **6/1/2018 07:50 PM**
Client ID: Run ID: **MOIST_180601G** SeqNo: **5068106** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	18.48	0.050	0	0	0	0-0	18.13	1.91	10	

DUP Sample ID: **1806095-01A DUP** Units: **% of sample** Analysis Date: **6/1/2018 07:50 PM**
Client ID: **4201** Run ID: **MOIST_180601G** SeqNo: **5068123** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.22	0.050	0	0	0	0-0	14.18	0.282	10	

The following samples were analyzed in this batch: 1806095-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
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Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 40810

ALS Project Manager: | ALS Work Order #: 1806095

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	James DeYoung CMP	A	See attached
Work Order		Project Number	133-17-001	B	
Company Name	EES	Bill To Company	HBEW	C	
Send Report To	Blaine Litteral, Amy Mandrell	Invoice Attn	Judy Visscher	D	
Address	400 136th Ave Bldg 100 Suite B	Address		E	
				F	
City/State/Zip	Holland, MI 49424	City/State/Zip		G	
Phone		Phone		H	
Fax	Blaine.Litteral@goelsolutionsinc.net	Fax		I	
e-Mail Address	Amy.Mandrell@goelsolutionsinc.net	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	4201	6.1.18	2:30pm	Soil		1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Amy Mandrell Amy Mandrell

Shipment Method:

Turnaround Time in Business Days (BD): ☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ Other ☑ 1 BD

Results Due Date:

Relinquished by: Amy Mandrell	Date: 6.1.18	Time:	Received by:	Notes:	
Relinquished by:	Date: 6.1.18	Time: 1550	Received by (Laboratory):		
Logged by (Laboratory): Kel	Date: 6/1/18	Time: 1635	Checked by (Laboratory):		

Cooler ID	Cooler Temp
SR2	1.2°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

James DeYoung CYAP

Parameter
Mercury
Arsenic
Barium
Beryllium
Boron
Cadmium
Lead
Lithium
Molybdenum
Selenium
Sulfate

ALS Group, USA

Sample Receipt Checklist

Client Name: **ENGENVSOL** Date/Time Received: **01-Jun-18 15:50**

Work Order: **1806095** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 01-Jun-18 (Date) Reviewed by: Bill Carey (eSignature) 05-Jun-18 (Date)

Matrices: Soil

Carrier name: Client

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):	18.2/18.2 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	6/1/2018 4:34:25 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:

APPENDIX D

AS-CONSTRUCTED DRAWINGS

G-001 TITLE SHEET

V-001 EXISTING CONDITIONS JULY 2017

C-101 REMOVAL RECORD

C-102 FINAL GRADING RECORD

C-501 HISTORICAL BENEFICIALLY REUSED CCR MATERIAL GRID POINT ELEVATIONS

HISTORICAL BENEFICIALLY REUSED CCR MATERIAL

HOLLAND BOARD OF PUBLIC WORKS

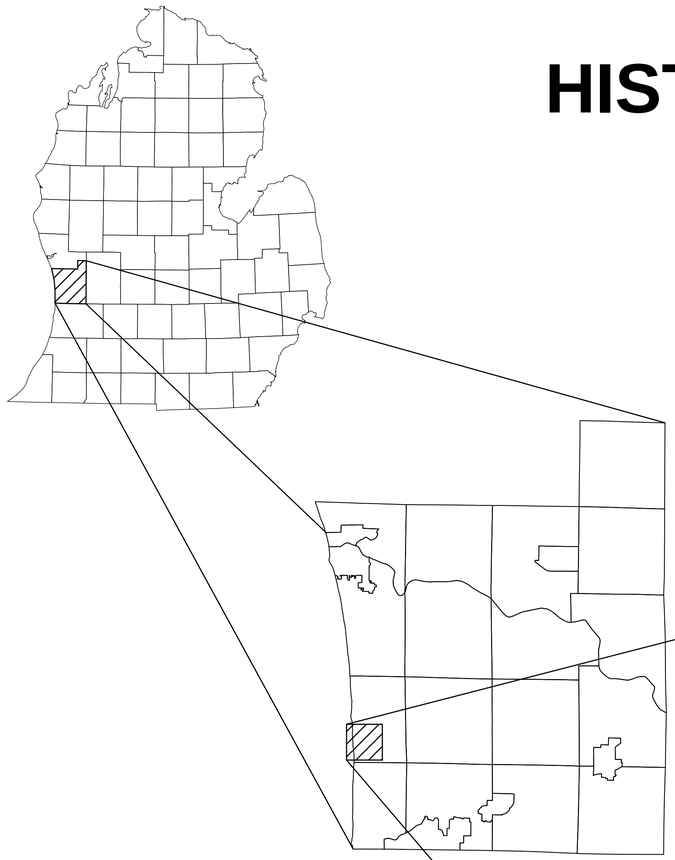
JAMES DEYOUNG POWER PLANT

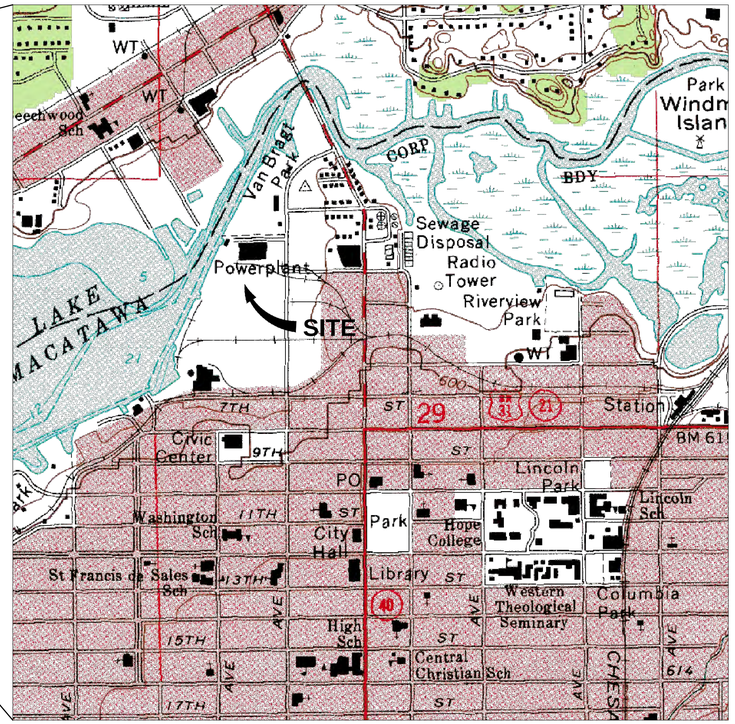
PREPARED BY:

Engineering & Environmental Solutions, LLC

PROJECT NO: 133-17-001

JULY 2018





64 PINE AVE, HOLLAND, MICHIGAN

SECTION 30 T. 5 N., R. 15 W.

CITY OF HOLLAND

OTTAWA COUNTY, MICHIGAN

SHEET INDEX

#	SHEET TIT
G-001	TITLE SHE
V-001	EXISTING
C-101	REMOVAL
C-102	FINAL GRA
C-501	CCR MATE AS CONST

DATUM AND BENC

DATUM: NAVD88, MI SOUTH ZON

BENCHMARK 1: BO N = E = ELE

BENCHMARK 2: CO N = E = ELE

DRAWING NOTES

1) EXISTING GROUN AND JULY 28, 201 JULY 28, 2017.

2) SOIL BORINGS CO

3) CLEAN ELEVATIO 2017.

4) FINAL GRADING A DECEMBER 7, 8, A JUNE 1, 2018.

HISTORICAL BENEFICIALLY REUSED CCR MATERIAL

LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR (5' INTERVAL)
- EXISTING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM — STM
- EXISTING DREDGE LINE — DRG — DRG — DRG
- EXISTING GAS LINE — GAS — GAS — GAS
- EXISTING SANITARY LINE — SAN — SAN — SAN
- EXISTING SNOW MELT LINE — SNW — SNW — SNW
- EXISTING STORM SEWER — STM — STM — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec — Elec
- EXISTING WATER LINE — WAT — WAT — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING

NOTES - EXISTING CONDITIONS PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.
3) REMOVAL OF TREES AND OTHER VEGETATION TO BE DONE WITH OWNER'S PERMISSION AND TO OWNER'S SATISFACTION.
4) BOTTOM OF COAL ELEVATIONS SHOWN ARE FROM JUNE 2016 AND OCTOBER 2016 SOIL BORINGS AND JULY 28, 2017 SURVEY AND ARE FOR INFORMATION ONLY.

LAKE MACATAWA
WSE = 581.37

JAMES DEYOUNG POWER PLANT

EXISTING SCREEN HOUSE
EXISTING LOADER GARAGE
EXISTING TRUCK GARAGE
BM #2
EXISTING 1200 GALLON UNDERGROUND STORAGE TANK
EXISTING LIMITS OF COAL/SOIL MIX
EXISTING 12" CIRCULATION WATER BYPASS LINE (APPROXIMATE LOCATION)
EXISTING 20" SNOW MELT LINE (APPROXIMATE LOCATION)
EXISTING TRENCH DRAIN AND CBs (APPROXIMATE LOCATION)
EXISTING 2-10" ROOF DRAINS (APPROXIMATE LOCATION)
EXISTING 6" STEEL PIPE
EXISTING HDPE WATER LINE WITH TRACER WIRE (APPROXIMATE LOCATION)
EXISTING CONCRETE PAD (APPROXIMATE LOCATION)
EXISTING 48" PIPE (APPROXIMATE LOCATION)
EXISTING 6" CONCRETE PIPE
EXISTING 18" DREDGE LINE
EXISTING 72" STORM PIPE (APPROXIMATE LOCATION)
EXISTING ACCESS ROAD
EXISTING MANHOLE
STORM JUNCTION BOX
EXISTING CONVEYER
EXISTING TOP OF BANK (TYP.)
EXISTING POND 1
WSE = 582.47
EXISTING BOTTOM OF BANK (TYP.)
EXISTING ELECTRIC LINE
EXISTING COAL RUNOFF COLLECTION DITCH
EXISTING LIGHT POLE
EXISTING 48" PIPE (APPROXIMATE LOCATION)
EXISTING HOPPER
EXISTING PUMP HOUSE
EXISTING MONITORING WELL
EXISTING 24" CMP CULVERT
EXISTING POND 2
WSE = 581.37
EXISTING 4" HDPE PIPE (APPROXIMATE LOCATION)
EXISTING 12" PIPE WITH STEEL VALVES
EXISTING CONCRETE RETAINING WALL
EXISTING PERIMETER FENCE
EXISTING LIGHT POLE
EXISTING LIMITS OF COAL/SOIL MIX
(OUTFALL 002)
EXISTING 84"x60" & 60"x60" STORM SEWERS (APPROXIMATE LOCATION)
VERIFY IF COAL/SOIL MIX PRESENT WEST OF FENCE DURING CONSTRUCTION
EXISTING EDGE OF DOCK
EXISTING 60" CONCRETE STORM PIPE (APPROXIMATE LOCATION)
APPROXIMATE LIMITS OF COAL PILES
EXISTING COAL PILE
EXISTING 24" PE STORM PIPE (APPROXIMATE LOCATION)
EXISTING 60" CONC. CULVERT INV ≈ 572.47 (OUTFALL 001)
EXISTING 24" PE STORM PIPE (APPROXIMATE LOCATION)
EXISTING 6" PIPE
EXISTING POND 3
WSE = 581.43
EXISTING MONITORING WELL
EXISTING WEIR OUTFALL BOX
EXISTING MONITORING WELL

S:\Projects\133 - NTH Consultants\133-17-001 HBPW Settling Pond and Coal Pile Closure Field Engineering\CAD\Report - Combined - EXISTING.dwg 9/7/2018 8:20 AM

LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR (5' INTERVAL)
- EXISTING MINOR CONTOUR (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM — STM
- EXISTING DREDGE LINE — DRG — DRG — DRG
- EXISTING GAS LINE — GAS — GAS — GAS
- EXISTING SANITARY LINE — SAN — SAN — SAN
- EXISTING SNOW MELT LINE — SNW — SNW — SNW
- EXISTING STORM SEWER — STM — STM — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec — Elec
- EXISTING WATER LINE — WAT — WAT — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- HISTORICAL BENEFICIALLY REUSED CCR MATERIAL - OVERALL LIMIT
- EXCAVATION MAJOR CONTOUR (5' INTERVAL)
- EXCAVATION MINOR CONTOUR (1' INTERVAL)

NOTES - REMOVAL PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.
3) REMOVAL OF TREES AND OTHER VEGETATION TO BE DONE WITH OWNER'S PERMISSION AND TO OWNER'S SATISFACTION.
4) OWNER TO PROVIDE AREAS FOR TEMPORARY FACILITIES, STOCKPILE AREAS, EQUIPMENT PARKING, AND HAUL ROUTES.
5) MW 1 THROUGH MW 3 SHALL BE ABANDONED OR REMOVED PER HOLLAND MDEQ STANDARD PROTOCOL.
6) EXCAVATE TO LIMITS OF COAL/SOIL MIXTURE AS DETERMINED BY THE OWNER.
7) EXCAVATE TO LIMITS OF CCR CONTAMINATED SOILS AND COAL-SOIL MIXTURE AS DETERMINED BY THE OWNER. DEWATERING WILL BE REQUIRED.

LAKE MACATAWA

BM #2

EXISTING SCREEN HOUSE

EXISTING LOADER GARAGE

EXISTING TRUCK GARAGE

JAMES DEYOUNG POWER PLANT

EXISTING 20" SNOW MELT LINE (APPROXIMATE LOCATION) REMOVE - MOVE WITHIN EXCAVATION LIMITS AND CAP REMAINING ENDS

EXISTING ACCESS ROAD REMOVE REMOVED

EXISTING 72" STORM PIPE (APPROXIMATE LOCATION) TO REMAIN - VERIFY DEPTH PRIOR TO CONSTRUCTION

EXISTING 18" DREDGE LINE REMOVE WITHIN LIMITS AND CAP LEFT IN PLACE

EXISTING POND 1

EXISTING POND 2

EXISTING POND 3

EXISTING COAL RUNOFF COLLECTION DITCH

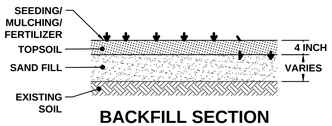
LIMITS OF BENEFICIALLY REUSED CCR

LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- EXISTING MAJOR CONTOUR AFTER EXC. (5' INTERVAL)
- EXISTING MINOR CONTOUR AFTER EXC. (1' INTERVAL)
- EXISTING FENCE
- EXISTING CULVERT — STM — STM
- EXISTING DREDGE LINE — DRG — DRG — DRG
- EXISTING GAS LINE — GAS — GAS — GAS
- EXISTING SANITARY LINE — SAN — SAN — SAN
- EXISTING SNOW MELT LINE — SNW — SNW — SNW
- EXISTING STORM SEWER — STM — STM — STM
- EXISTING UNDERGROUND ELECTRIC LINE — Elec — Elec
- EXISTING WATER LINE — WAT — WAT — WAT
- EXISTING BENCHMARK
- EXISTING BOLLARD
- EXISTING CATCH BASIN
- EXISTING ELECTRIC BOX
- EXISTING LIGHT POLE
- EXISTING MONITORING WELL
- EXISTING SANITARY MANHOLE
- EXISTING SNOW MELT MANHOLE
- EXISTING SNOW MELT VALVE
- EXISTING STORM MANHOLE
- EXISTING STORM VALVE
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT
- EXISTING GRAVEL
- EXISTING LANDSCAPING
- HISTORICALLY BENEFICIALLY REUSED CCR MATERIAL - REMOVAL LIMIT
- HISTORICALLY BENEFICIALLY REUSED CCR MATERIAL - REMAINING LIMIT
- EXCAVATION MAJOR CONTOUR (5' INTERVAL)
- EXCAVATION MINOR CONTOUR (1' INTERVAL)
- GRID POINT
- GRID POINT - CCR SAMPLE LOCATION
- TEST PIT

NOTES - GRADING PLAN

1) SEE TITLE SHEET FOR LOCATION MAP, DATUM, BENCHMARKS, AND DRAWING NOTES.
2) CONTRACTOR SHALL PROTECT EXISTING MONITORING DEVICES DURING CONSTRUCTION. INCLUDE LABOR TO ADJUST MONITORING DEVICES WHERE NECESSARY DUE TO CONSTRUCTION ACTIVITIES.



BACKFILL SECTION

NOT TO SCALE

Point Number	Northing	Easting	Original Elevation	Cleaned Elevation	Sand Elevation	Topsoil Elevation
4200	476800.00	12654733.33	585.18	576.00	583.78	584.28
4201	476766.67	12654766.67	587.45	580.41	582.38	583.05
4204	476733.33	12654800.00	586.89	579.27	583.51	584.01
4206	476700.00	12654800.00	587.43	580.36	582.98	583.48
4209	476666.67	12654800.00	587.39	578.85	581.76	582.18
4210	476666.67	12654833.33	584.38	578.35	581.96	582.96
4212	476633.33	12654800.00	587.64	578.60	581.75	582.17
4213	476633.33	12654833.33	586.53	578.80	581.61	582.11
4214	476633.33	12654866.67	583.85	579.35	582.04	583.04
4215	476600.00	12654800.00	587.80	578.25	581.70	582.03
4216	476600.00	12654833.33	586.05	579.35	581.77	582.10
4217	476600.00	12654866.67	583.59	578.77	581.64	582.64
4218	476566.67	12654766.67	588.22	580.00	581.71	582.05
4219	476566.67	12654800.00	587.21	579.00	581.78	582.19
4220	476566.67	12654833.33	585.36	578.95	581.55	581.96
4221	476566.67	12654866.67	583.39	577.40	581.48	582.48
4222	476533.33	12654733.33	586.02	581.36	581.50	582.16
4223	476532.74	12654766.67	588.25	580.31	581.11	581.78
4224	476533.33	12654800.00	586.72	578.30	581.48	582.15
4225	476533.33	12654833.33	584.16	578.40	581.61	582.11
4226	476533.33	12654866.67	583.33	581.50	582.06	582.72
4227	476500.00	12654733.33	587.53	581.20	581.58	582.25
4228	476500.00	12654766.67	587.41	580.15	581.16	581.75
4229	476500.00	12654800.00	585.24	578.80	581.54	582.12
4230	476500.00	12654833.33	583.98	579.80	581.72	582.14
4231	476466.67	12654766.67	586.36	581.08	581.49	582.24
4232	476466.67	12654800.00	584.46	578.73	582.08	582.66

NOTES - HISTORICAL BENEFICIALLY REUSED CCR MATERIAL

1) CCR VERIFICATION POINTS ARE NOT SEQUENTIAL: CCR MATERIAL AT VERIFICATION POINTS LOCATED OVER THE SNOWMELT LINES WERE LEFT IN PLACE.

ATTACHMENTS

A.1- A.4

A.1 - Coal Yard Closure Report

A.2 - CCR Impoundment Closure Report

A.3 - CCR Beneficial Use Documentation Report

A.4 –Addendum Rpt_Rev 2

James DeYoung Power Plant

Coal Combustion Residual (CCR) Impoundments Addendum

Holland Board of Public Works

Holland, Michigan

NTH Project No. 73-160017-05

January 2019

Revision 2 – March 25, 2019

NTH Consultants, Ltd.
608 S, Washington Avenue
Lansing, MI 48933

INTRODUCTION

As part of their initial review of documentation presented in the Closure Certification Coal Combustion Residual (CCR) Impoundments report, the Michigan Department of Environmental Quality (MDEQ) requested additional information from the Holland Board of Public Works (HBPW) related to CCR excavation depth in the southwestern corner of the property. It was requested that we provide documentation summarizing the elevations identified for the bottom of CCR layers encountered at certain boring locations during the subsurface investigation conducted during October 2016. This information was collected as part of the initial site investigation in areas of historical CCR material handling activities at the James DeYoung power plant property (the Property). In response to this request, Engineering and Environmental Solutions, LLC (EES) prepared a CCR Excavated Surface Site Map.

It was noted that, with the exception of information documented at two adjacent boring locations in the southwest corner of the Property, the bottom of observed CCR material elevations identified at each of the other various Geoprobe locations were above the surveyed elevations following the CCR removal. In the southwest corner of the Property, the boring logs indicated that the bottom of CCR material at boring 5076 to be at 580.1 feet (ft.), and 579.9 ft. for boring 5076A. These elevations were approximately one foot lower than the surveyed elevations after excavation that were measured in the vicinity of these initial borings (an expanded/enlarged map depicting the survey details in this area is included on the attached Figure 1).

In order to collect information to further document that CCR removal was sufficient in the vicinity of Geoprobe borings locations 5076 and 5076A, additional hand auger borings were completed on December 20th, 2018. Subsoil samples were collected from the layer of soil just below the newly placed sand and topsoil layers. The samples were examined for evidence of CCR residuals using the physical observation and microscopy techniques discussed in the CCR closure report.

INVESTIGATION OF CCR MATERIAL REMOVAL

Hand auger borings were used to revisit the current conditions in the vicinity of former Geoprobe boring locations 5076 and 5076A. Subsoil ground surface elevations after excavation of CCR

residuals in this area were reportedly higher than the bottom of ash observed during the review of recovered materials from the original Geoprobe borings. After placement of sand backfill and topsoil, the uppermost elevation at boring location 5076A is 582.1 ft. A hand auger was used to bore down to an elevation of 579 ft. The current elevation at boring location 5076 is 582.12 ft., and a hand auger was used to bore down to 579.43 ft. The subsurface profile for each new boring was recorded as 5076A-1 and 5076-1.

The results of the supplemental soil borings and microscopy evaluation at boring locations 5076 and 5076A are included in the attached documentation. Included is a field report for the investigation completed and photographs of various samples completed at 40 times magnification.

The photographs of the microscopic examination were re-examined and a scale to estimate the size of the particles was included. Enlargements of these photographs have been included in Attachment V, included in this revised report. The individual markings on the scale that has been included on the photos om Attachment V represents 0.2 mm such that the entire field shown in the enlarged photographs is approximately 5 mm across. In addition, photos of a CCR sample and a 5% CCR/sand mixture had been prepared by EES; these photos are included in Attachment V for comparison purposes. Electronic copies of the digital photographs can be made available for download with the updated report.

During the field assessment, based on color and texture, a layer of what appeared to be CCR containing material was identified at boring 5076-A-1 from a depth of 1 to 1.6 ft. below ground surface (elevation of 581.1 ft. to 580.5 ft.). Based on the initial field identification of potential CCR material in this sample, three additional borings were completed 5 feet to the east, north and west (5076-5 ft. E, 5076-5 ft. N and 5076-5 ft. E) of boring 5076A-1. The soil samples collected from the three additional borings did not identify visual evidence of CCR material. The groundwater level in the borings was found to be about 1 ft. below ground surface at an approximate elevation of 581.0 at the completion of boring activities. A GPS survey of each

boring location was completed during boring activities using methods consistent with those used for previous investigations.

Collected soil samples were transported to EES' office and initially examined using a microscope at 40 times magnification and photographs were collected. This examination showed that the sample initially identified as potentially containing CCR material actually had a very small percentage of CCR material mixed with soil (less than 5 percent). All other samples did not contain CCR materials.

Subsequently, at a meeting with MDEQ staff on March 20, 2019 at the Grand Rapids District Office, soil samples from the 5076-1 and 5076A-1 boring locations were physically examined. The samples were further examined using a USB microscope, and it was determined that there was no visible evidence of CCR in these samples. Since it was not possible to take photographs of the soil samples examined at that time, NTH subsequently obtained and photographed soil samples from these locations using a Plugable 250x Digital USB Microscope. Example copies of these photos are included in Appendix VI. The examination of representative soil samples from these locations did not contain evidence of CCR materials.

All soil samples collected during the December 2018 assessment have been retained pending completion of review by MDEQ.

INVESTIGATION SUMMARY DISCUSSION

The microscopic examination of all soil samples collected from the uppermost layer of subsoil beneath the sand and topsoil fill confirms that the soils samples collected at the two original boring locations, and all other boring locations in the vicinity did **not** identify materials with more than 5% CCR or coal. Further examination of the enlarged photographs, electronic copies of the enlarged digital photographs, and subsequent examinations using USB microscopes confirm that the original field observations completed in December 2017 to determine the extent of CCR and coal removal, and the survey elevations completed during CCR removal activities are correct. It should also be noted that because the gray silty soils observed at boring location 5076A-1 are very similar in color and texture to CCR material and it took microscopic

examination to verify ash was not present, it is also likely that the ash layer originally logged during initial Geoprobe boring activities at boring locations 5076 and 5076A was likely to have been misidentified.

ATTACHMENT I

CCR EXCAVATED SURFACE MAP

LEGEND

- LIMITS OF PRE-CONSTRUCTION GROUND SURVEY
- CCR IMPOUNDMENT GRADING LIMIT
- HISTORICALLY BENEFICIALLY REUSED CCR MATERIAL - REMOVAL LIMIT
- EXCAVATION MAJOR CONTOUR (5' INTERVAL)
- EXCAVATION MINOR CONTOUR (1' INTERVAL)
- EXISTING BENCHMARK
- BOTTOM OF ASH ELEVATION FROM BORINGS — ▲582.9 5076C BOT ASH
- 2018-12-20 BORING LOCATIONS
- EXISTING SURFACE CONCRETE
- EXISTING PAD CONCRETE
- EXISTING ASPHALT

NOTES

1) BOTTOM OF ASH ELEVATIONS SHOWN ARE FROM JUNE 2016 AND OCTOBER 2016 SOIL BORINGS AND JULY 28, 2017 SURVEYS.
2) EXCAVATION ELEVATIONS ARE FROM OCTOBER 2017 THROUGH JUNE 2018 SURVEYS.
3) EXCAVATED AREAS WERE REGRADED PRIOR TO SURVEY AND PLACEMENT OF BACKFILL.
4) CONTOURS WITHIN THE CCR IMPOUNDMENT GRADING LIMIT ARE FROM ELEVATIONS TAKEN AT THE GRID NODES AT TIME OF VERIFICATION. CONTOURS FOR AREAS OUTSIDE THE CCR IMPOUNDMENT GRADING LIMIT ARE ESTIMATES ONLY.
5) THIN LAYER OF ASH SHOWN BY BORINGS NOT OBSERVED DURING COAL REMOVAL.
6) BORINGS 5076 AND 5076A WERE REVISTED AND SURVEYED DECEMBER 20, 2018.

5076-1		
Depth (feet BGS)	Elevation (feet above msl)	Description
	582.18	Ground Surface
0.0-0.7	581.48	Brown topsoil, fine gravel
0.7-2	580.18	Fine brown sand
2.0-2.75	579.43	Dark brown clay with organics, some marl around 2.1'

5076A-1		
Depth (feet BGS)	Elevation (feet above msl)	Description
	582.1	Ground Surface
0.0-0.7	581.4	Brown topsoil, fine gravel
0.7-1.0	581.1	Fine brown sand
1.0-1.6	580.5	Gray silty fine sand, possible ash mixed in
1.6-3.0	579.1	Gray silty fine sand mix with organics and marl, some gravel
3.0-3.1	579	Gray fine sandy silt

5076-5'N		
Depth (feet BGS)	Elevation (feet above msl)	Description
	582.03	Ground Surface
0.0-0.5	581.53	Brown topsoil, fine gravel
0.5-1.0	581.03	Fine brown sand
1.0-2.0	580.03	Gray fine sandy silt, trace clay and marl
2.0-2.5	579.53	Mucky fine sand, trace wood
2.5-3.0	579.03	Clayey sand with organics

5076-5'E		
Depth (feet BGS)	Elevation (feet above msl)	Description
	582	Ground Surface
0.0-0.7	581.3	Brown topsoil, fine gravel
0.7-1.3	580.7	Fine brown sand
1.3-3	579	Gray silty fine sand with organics and rounded stones

5076-5'W		
Depth (feet BGS)	Elevation (feet above msl)	Description
	582.13	Ground Surface
0.0-0.8	581.33	Brown topsoil, fine gravel
0.8-1.2	580.93	Brown fine sand
1.2-1.8	580.33	Dark brown sand with gray fine material, trace wood, and trace gravel
1.8-2.3	579.83	Brown fine sand, organics present, clay and marl layers
2.3-3	579.13	Dark gray silty sand mix with organic (clay, wood, and marl) layers

LAKE MACATAWA
WSE = 581.37

BM #2

BM #1

EXISTING SCREEN HOUSE

EXISTING LOADER GARAGE

EXISTING TRUCK GARAGE

EXISTING CONCRETE PAD

JAMES DEYOUNG POWER PLANT

EXISTING SUBSTATION

SITE ENTRANCE

EXISTING GAS BUILDING

3RD ST.

PINE AVE.

SEE NOTE 5

LIMITS OF BENEFICIALLY REUSED CCR REMOVAL

N

0 40 80

SCALE: 1"=40'
(FOR 24"x36" PLAN SHEET)

Engineering & Environmental Solutions, LLC
400 136th Avenue, Building 100, Suite B, Holland, Michigan 49424
Phone/Fax: (616) 994-6541
www.goEESolutions.net

CCR IMPOUNDMENT SYSTEM CLOSURE
HOLLAND BOARD OF PUBLIC WORKS
SECTION 30 T. 5 N., R. 15 W., CITY OF HOLLAND, OTTAWA COUNTY
JAMES DEYOUNG POWER PLANT
HOLLAND, MICHIGAN

MARK	DATE	DESCRIPTION
	10-15-2018	ISSUED FOR OWNER REVIEW

DESIGNED BY:	DS
DRAWN BY:	AM
CHECKED BY:	BL
PROJECT NO:	133-17-001

SHEET TITLE

CCR EXCAVATED SURFACE

SHEET 1 OF 1

V-001

ATTACHMENT II

FIGURE 1 – COMPARISON OF CCR BOTTOM ELEVATION DETAILS – SOUTHWEST CORNER

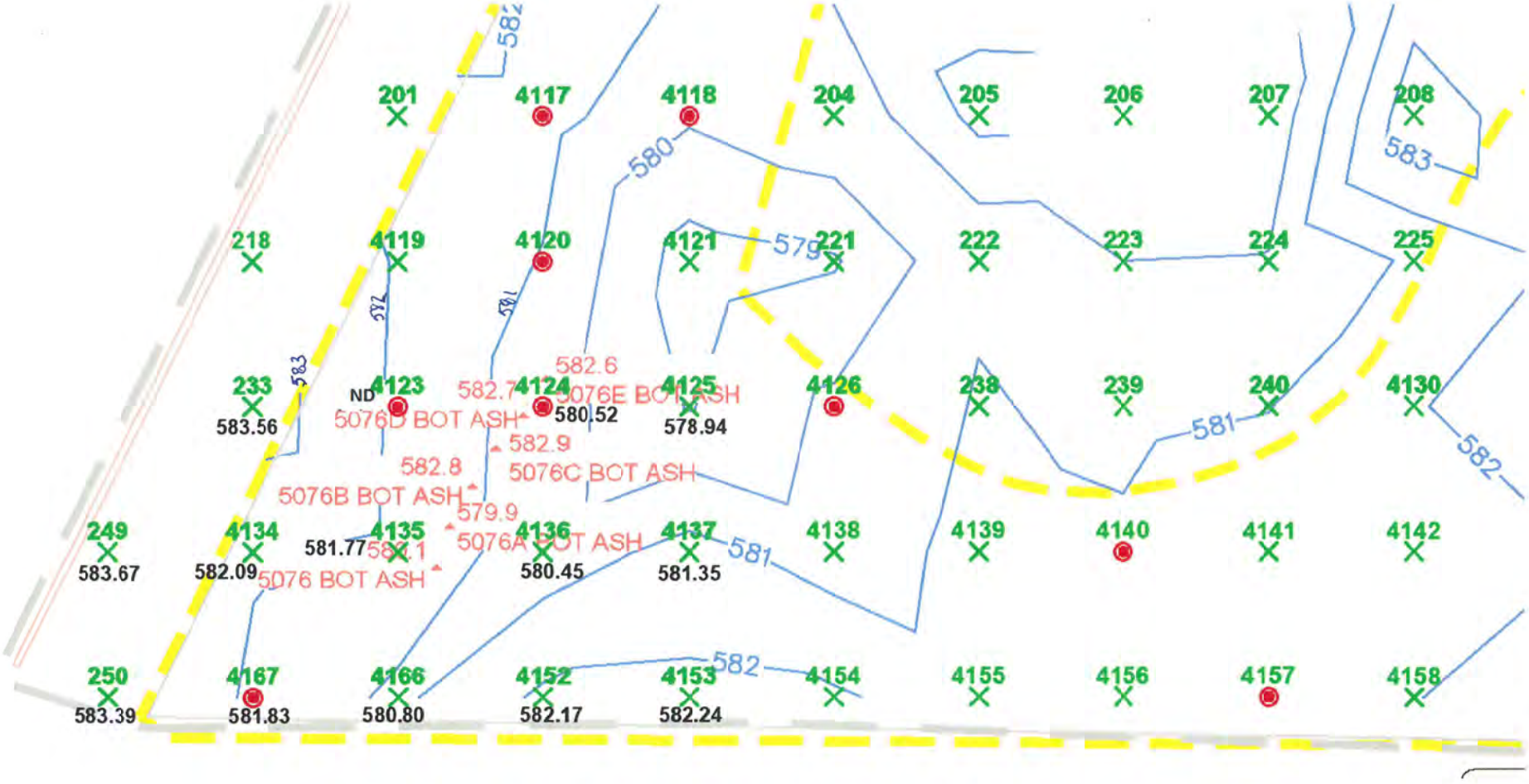


Figure 1 – Comparison CCR Bottom Elevation Details – Southwest Corner of James DeYoung Power Plant Property

ATTACHMENT III

2018-12-20 FIELD REPORT

Engineering & Environmental Solutions, LLC

Daily Report

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Date: 12/20/2018

Time Arrived: 8:55 Time Left: 12:00 Page: 1 of 1

Weather: Cloudy Precipitation: None Temp: 43 °F

Personnel on Site

Owners:	Trista Gregorski
Contractors:	
Contractors:	
CQA:	E&E Solutions, Kurt Van Appledorn, Amy Mandrell
Other:	

Summary of Construction Activities

Summary of CQA Activities

Used a hand auger to revisit boreholes 5076 and 5076A, originally logged on 10-11-16. Initial logs showed the bottom of ash for boring 5076 was at 580.1', and 579.9' for boring 5076A. Cleaned elevations for these points during excavation were found to be higher than the bottom of ash. The current elevation at boring location 5076A was 582.1', and a hand auger was used to bore down to 579'. The current elevation at boring location 5076 was 582.12', and a hand auger was used to bore down to 579.43'.

The subsurface profile for each new boring was recored as 5076A-1 and 5076-1. Dark, possible ashy material was observed in borehole 5076A-1 from 1' to 1.6'. 1.0' to 1.2' was noted as a dark gray silty material with possible ash, and 1.2' to 1.6' was noted as a gray fine sand with possible ash mixed in. After inspection via microscope, the ash appears to be present at less than 5%, but it is hard to tell without a more powerful microscope due to the fine grains.

Three additional borings were made surrounding 5076A - 5' north (5'N), 5' east (5'E), and 5' west (5'W).

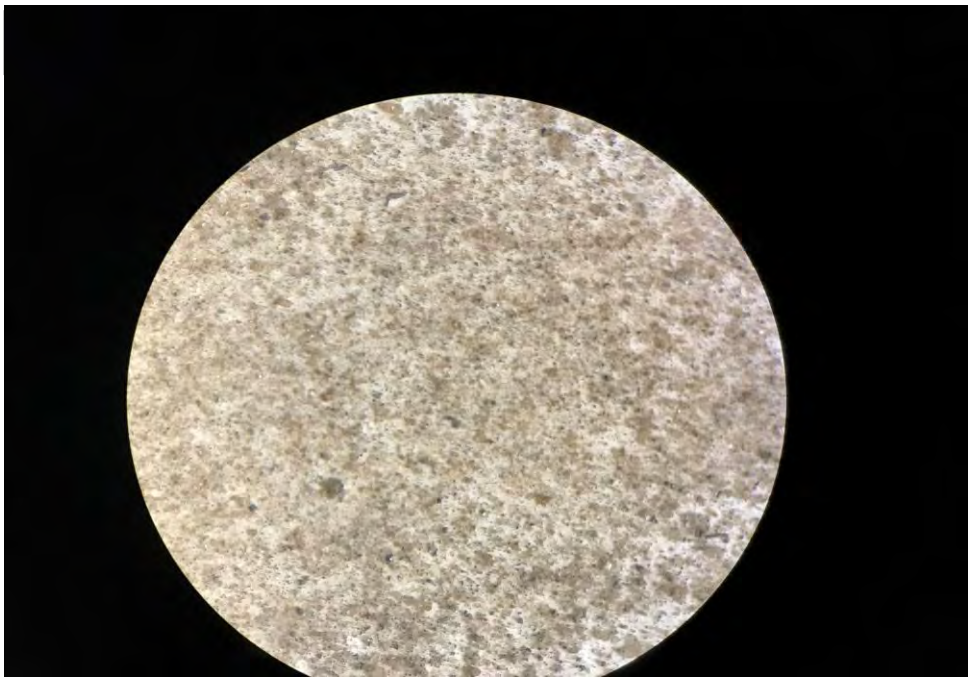
All of the gray colored material collected from each borehole was inspected under the microscope. It was concluded that less than 5% ash was present in the gray silty materials collected in 5076-1 1.2'-1.6'.

Notes:

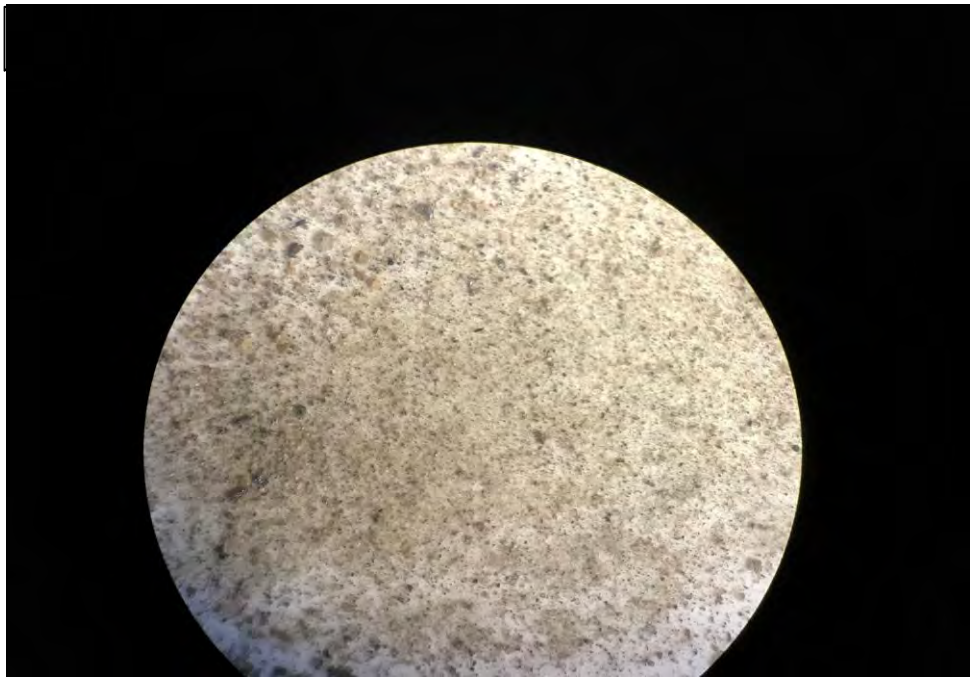
Inspector: Amy Mandrell Signature: Amy Mandrell

ATTACHMENT IV

MICROSCOPE EVALUATION



5076A-1 1.0-1.2' Gray silty fine sand, possible ash mixed in - ash appears to be less than 5%



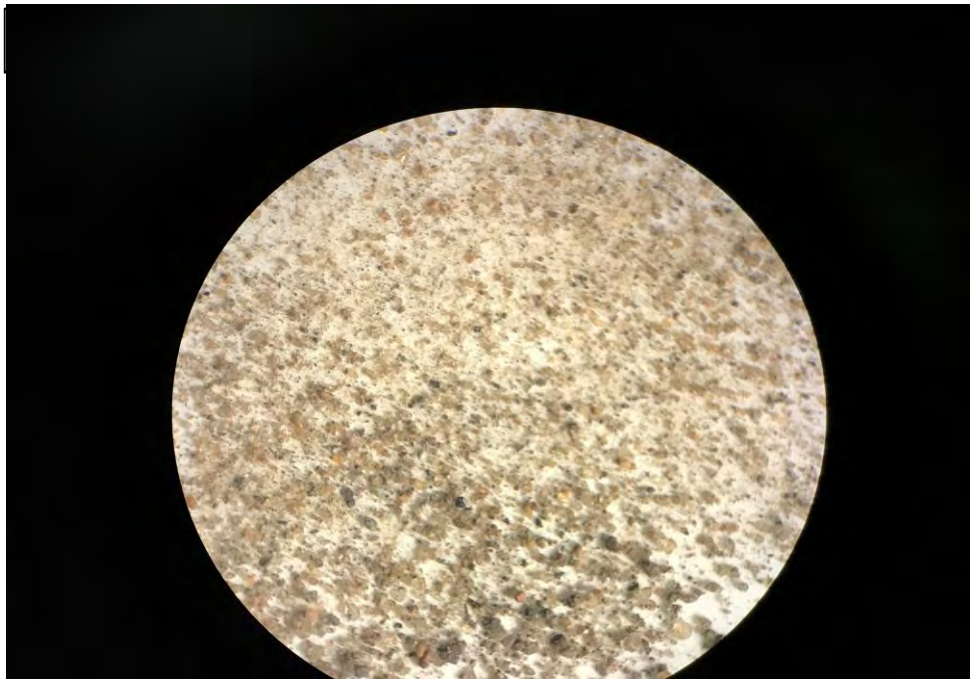
5076A-1 1.2-1.6' Gray silty fine sand, possible ash mixed in - ash appears to be less than 5%

Engineering & Environmental Solutions, LLC

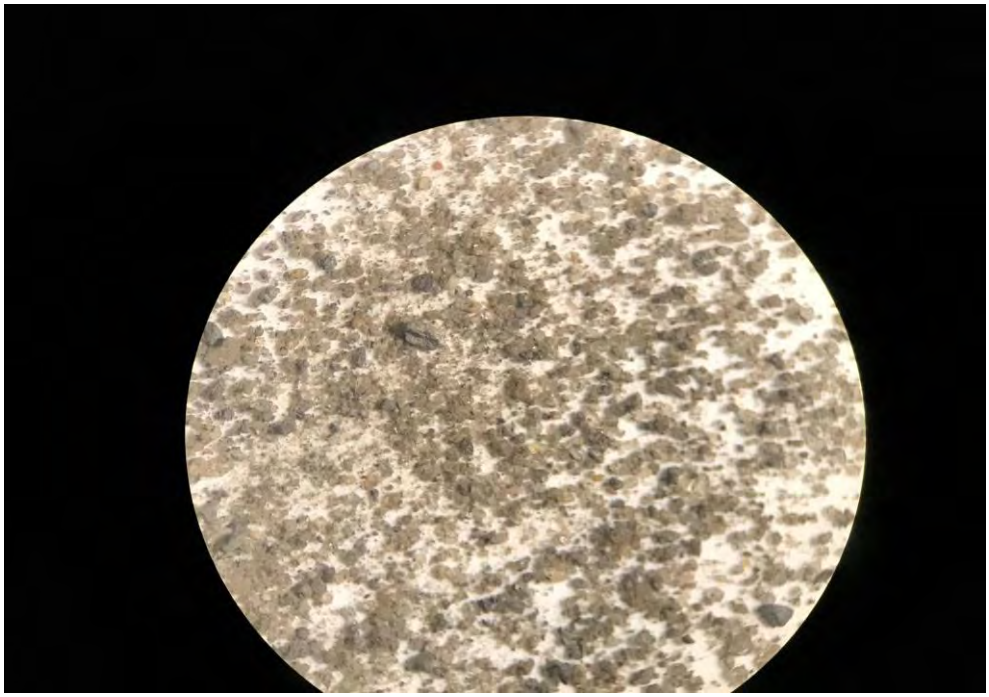
Documentiaton Pictures

Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 5076A-1

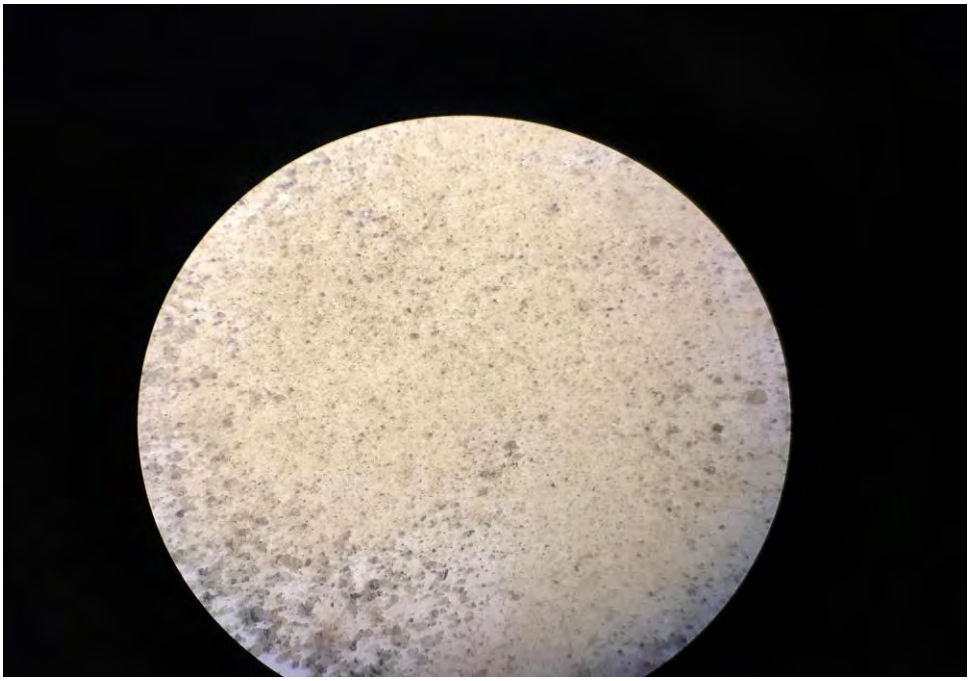
5076A-1



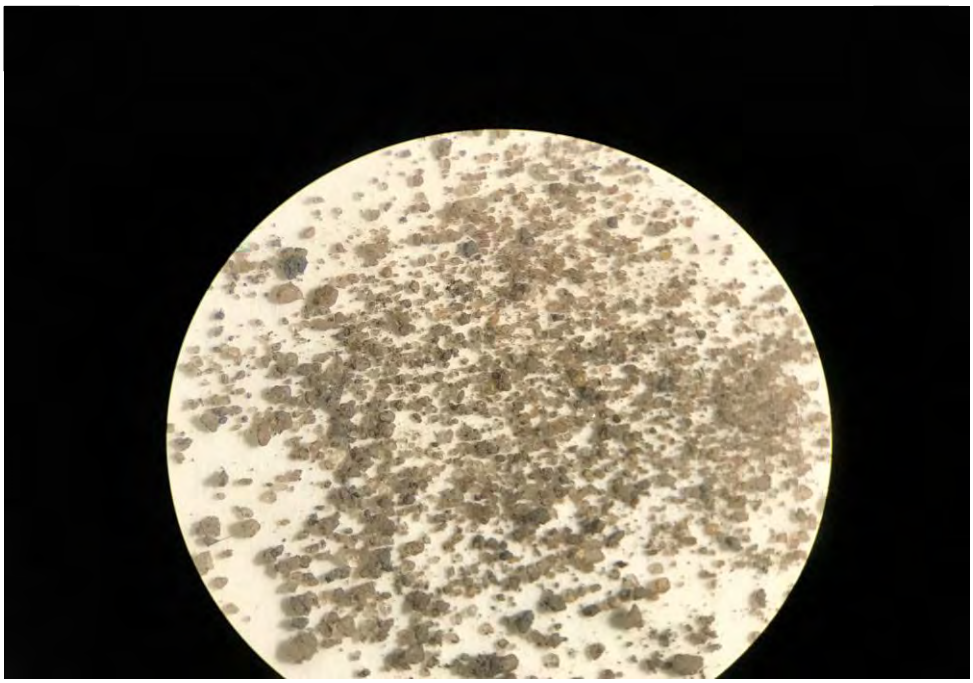
5076A-1 1.6-2.0' Gray silty fine sand with organics and marl, some gravel



5076A-1 2.0-2.1' Gray silty fine sand mix with organics and marl, some gravel



5076A-1 2.1-3.0’ Gray silty fine sand mix with organics and marl, some gravel

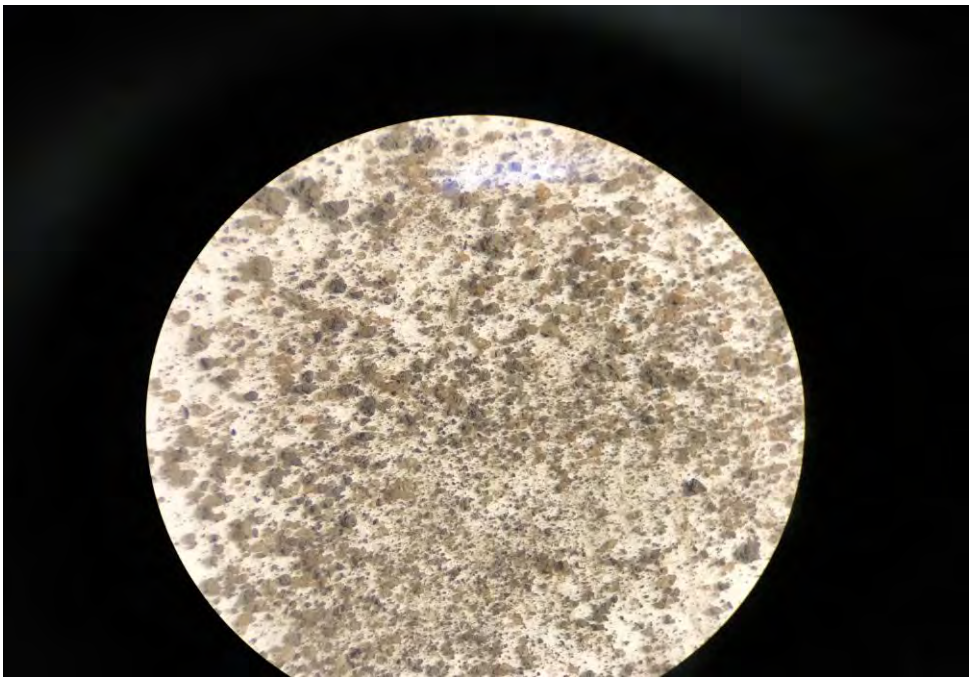


5076A-1 3.0-3.1’ Gray fine sandy silt

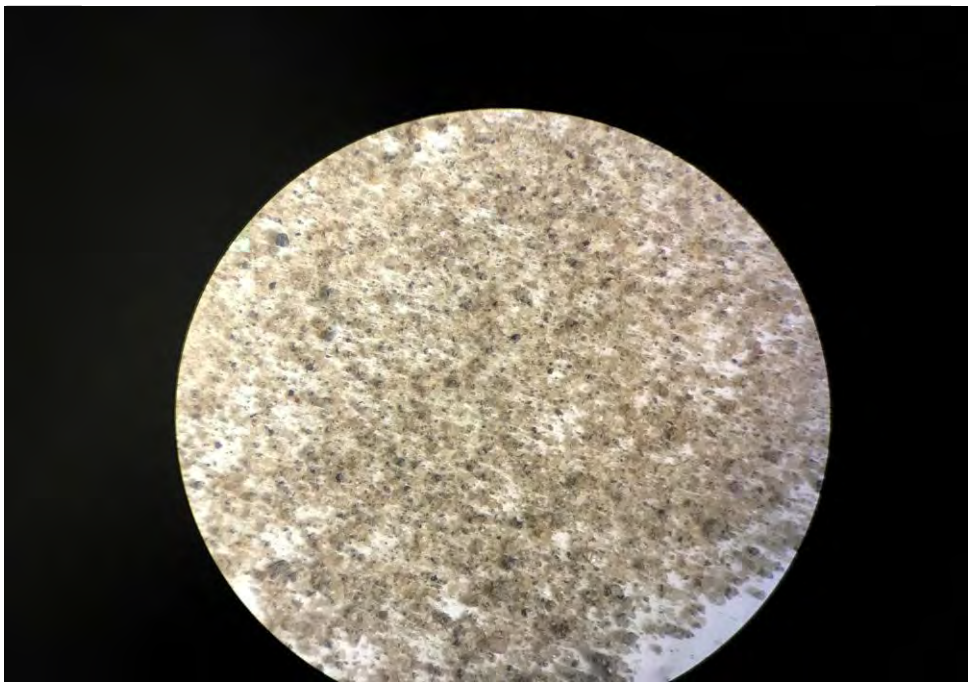
Engineering & Environmental Solutions, LLC

Documentiaton Pictures

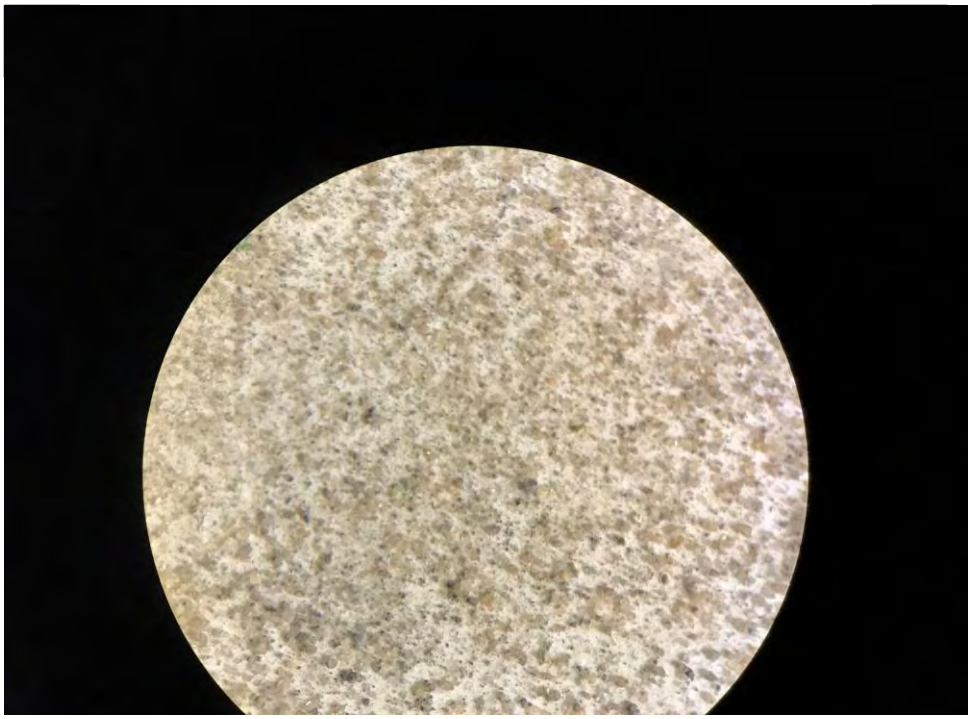
Project: James DeYoung Power Plant CCR Impoundment System Closure Project No: 133-17-001 Points: 5076-1, 5076-5'N



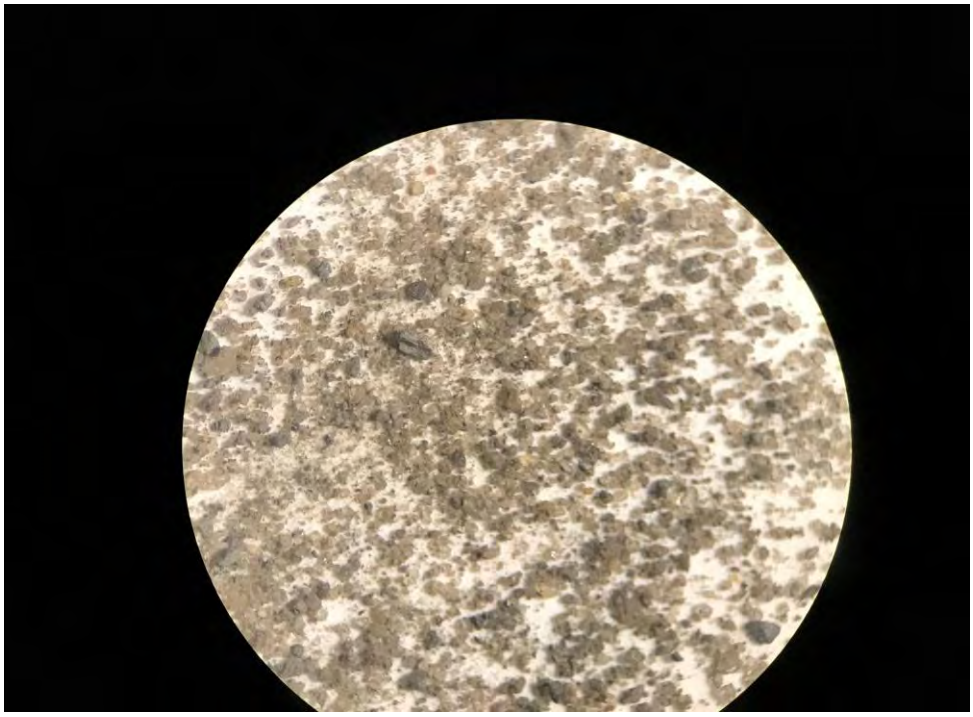
5076-1 2.0 -2.75' Dark brown clay with organics, some marl around 2.1'



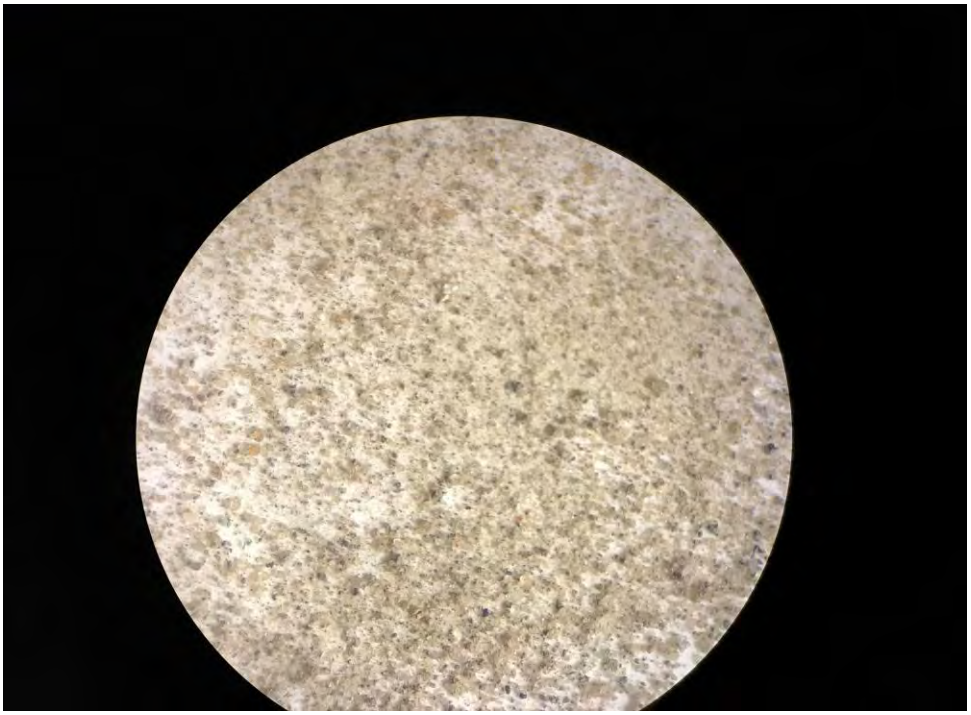
5076-5'N 1.0-1.6' Gray fine sandy silt, trace clay and marl



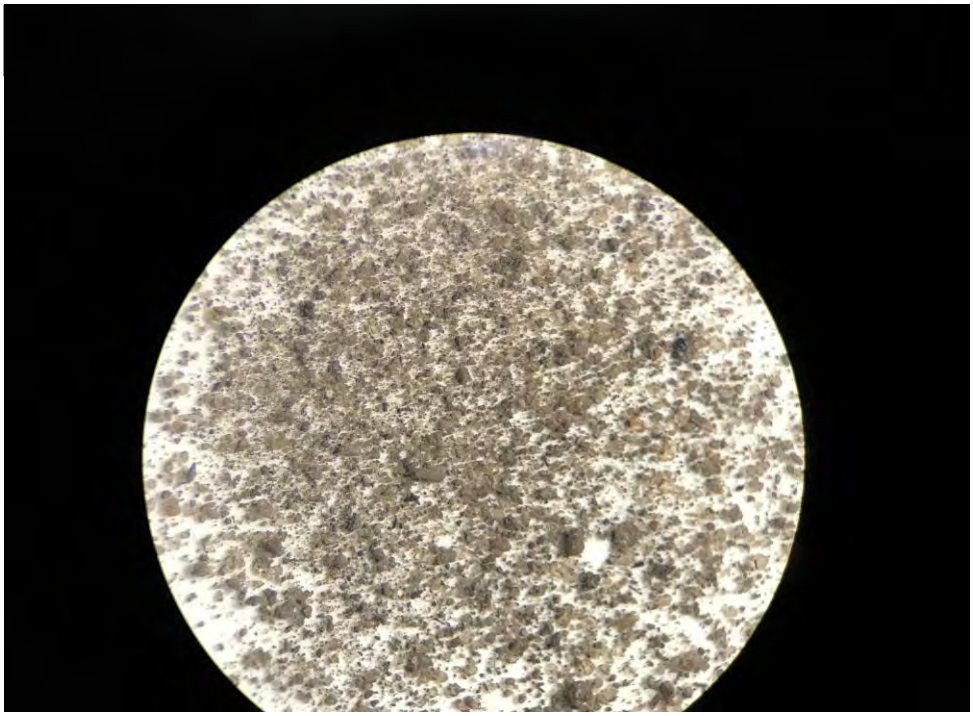
5076-5'N 1.6-2.0' Gray fine sandy silt, trace clay and marl



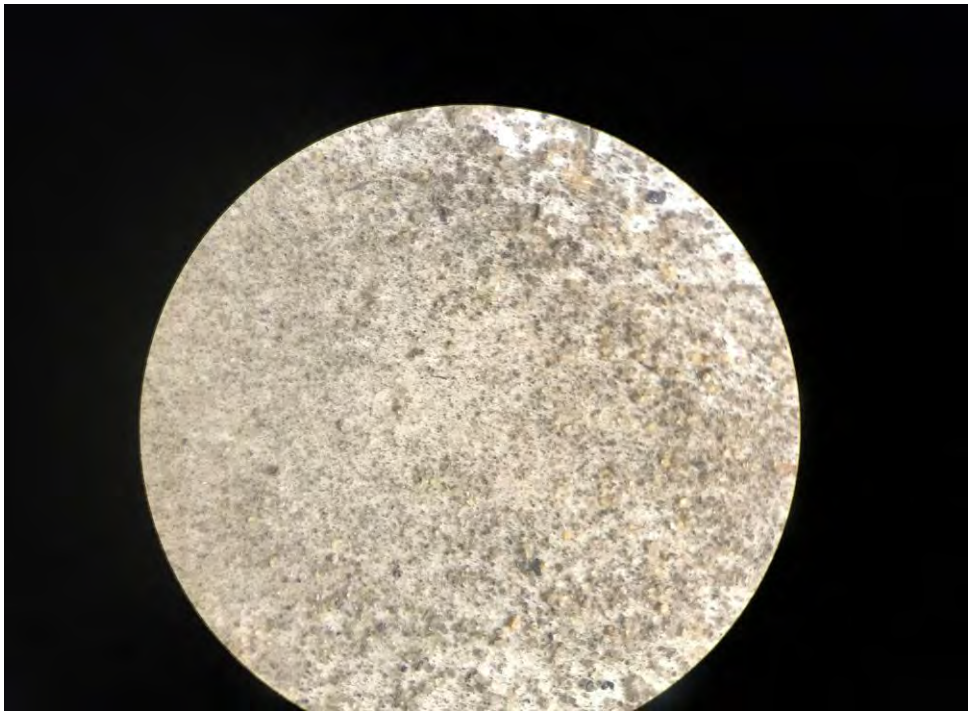
5076-5'N 2.0-2.5' Mucky fine sand, trace wood



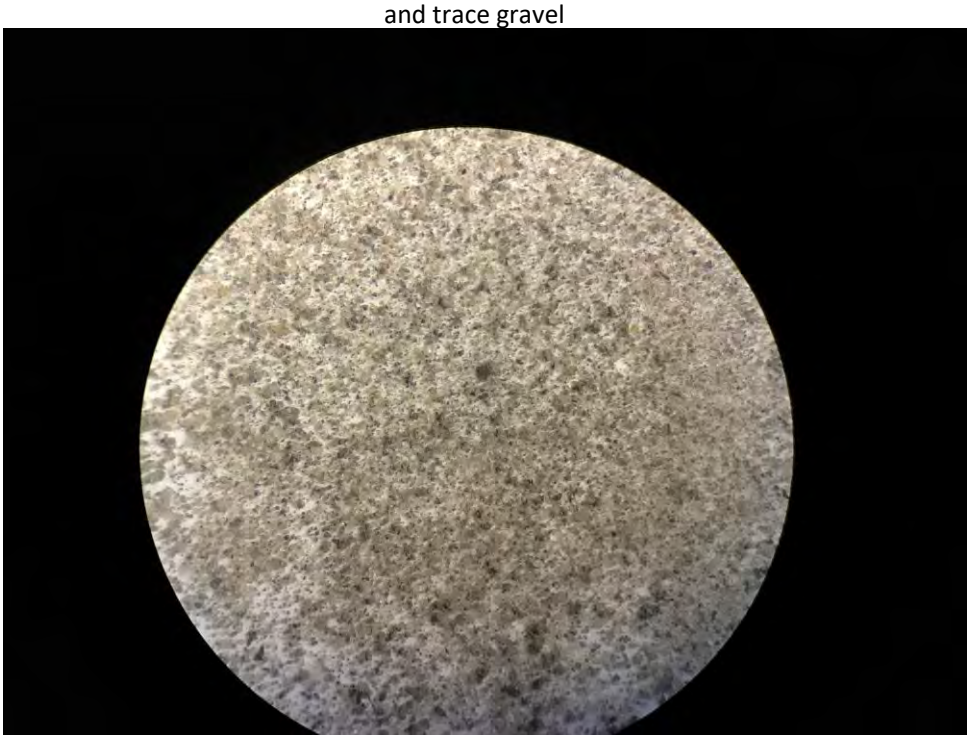
5076-5'E 1.3-2.0' Gray silty fine sand with organics and rounded stones



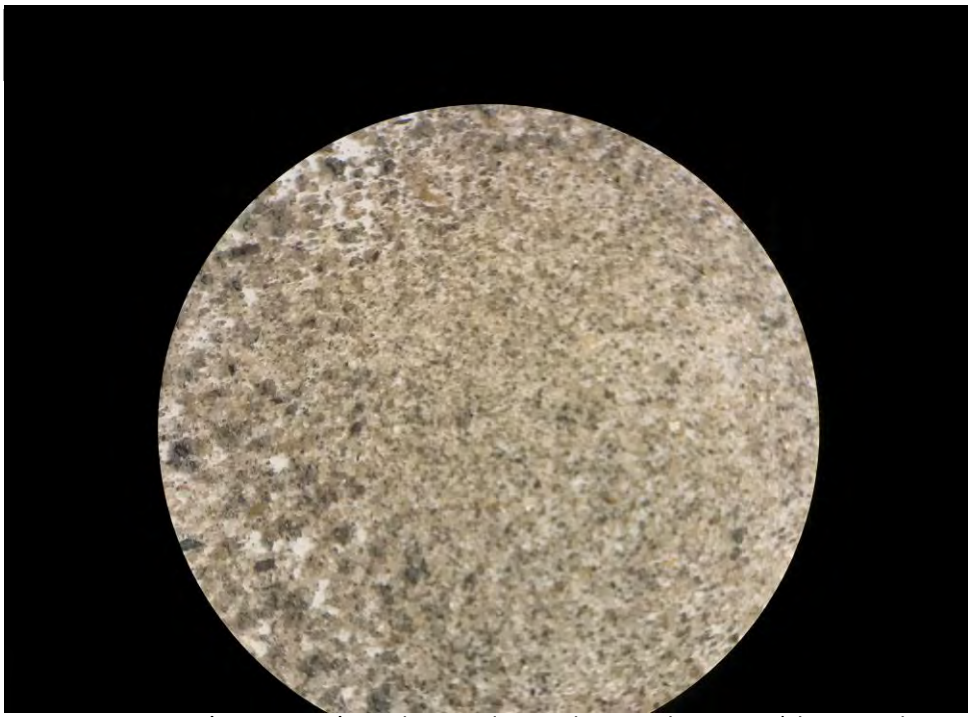
5076-5'E 2.0-3.0' Gray silty fine sand with organics and rounded stones



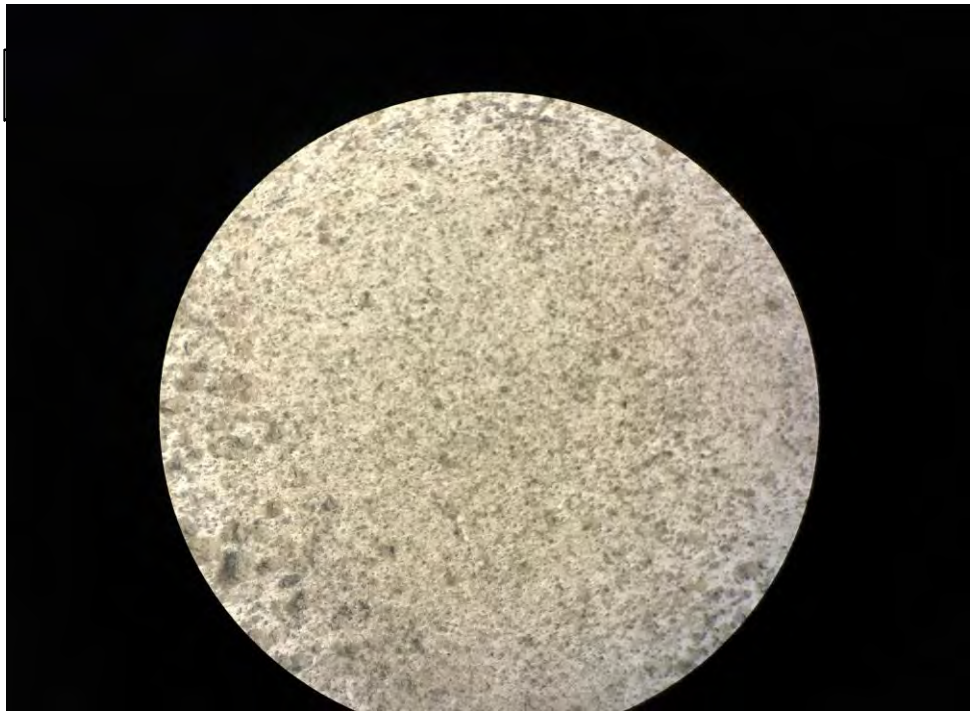
5076-5'W 1.2-1.8' Dark brown sand with gray fine material, trace wood, and trace gravel



5076-5'W 1.8-2.3' Brown fine sand, organics present, clay and marl layers



5076-5'W 2.3-2.6' Dark gray silty sand mix with organic (clay, wood, and marl) layers



5076-5'W 2.6-3.0' Dark gray silty sand mix with organic (clay, wood, and marl) layers

ATTACHMENT V

ENLARGED PHOTOGRAPHS OF MICROSCOPE EVALUATION

The individual markings on the scale shown on the photos represents 0.2 mm; thus the entire field is approximately 5 mm across.

Photo ID 1_Location 5076-1 (2-2.75')

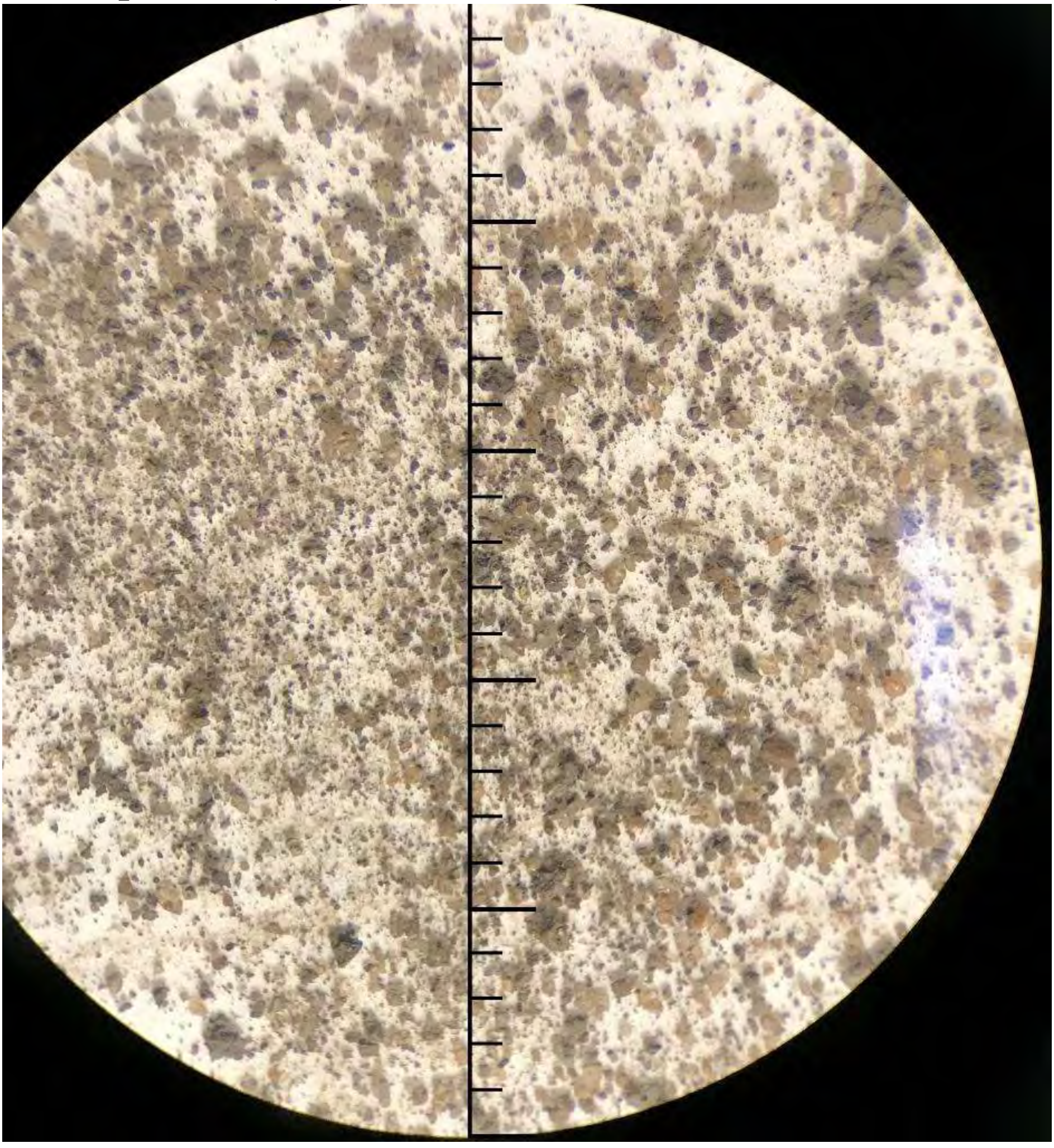


Photo ID 2a_Location 5076A-1 (1 – 1.2’)

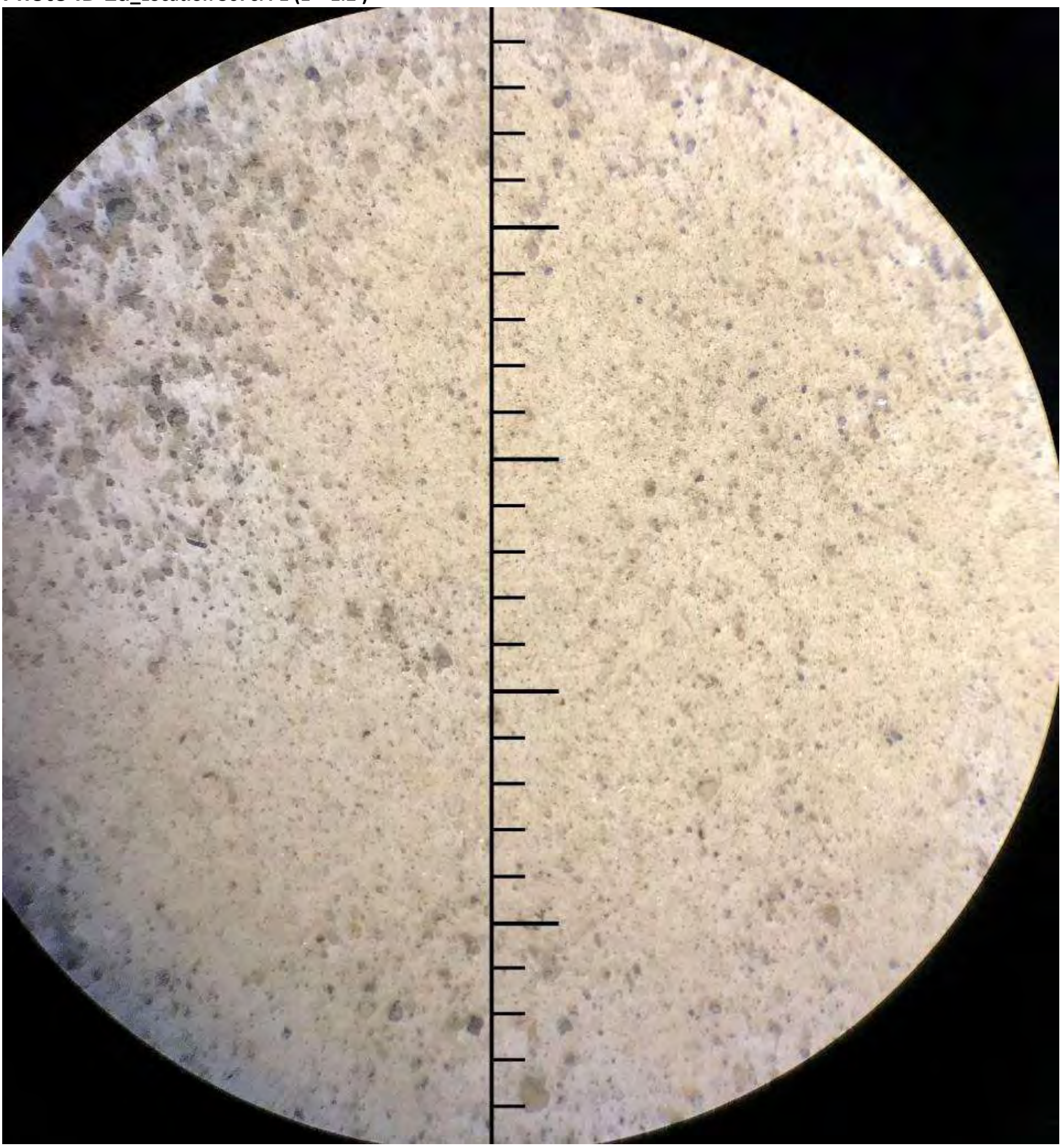


Photo ID 2b_Location 5076A-1 (1.2 – 1.6')

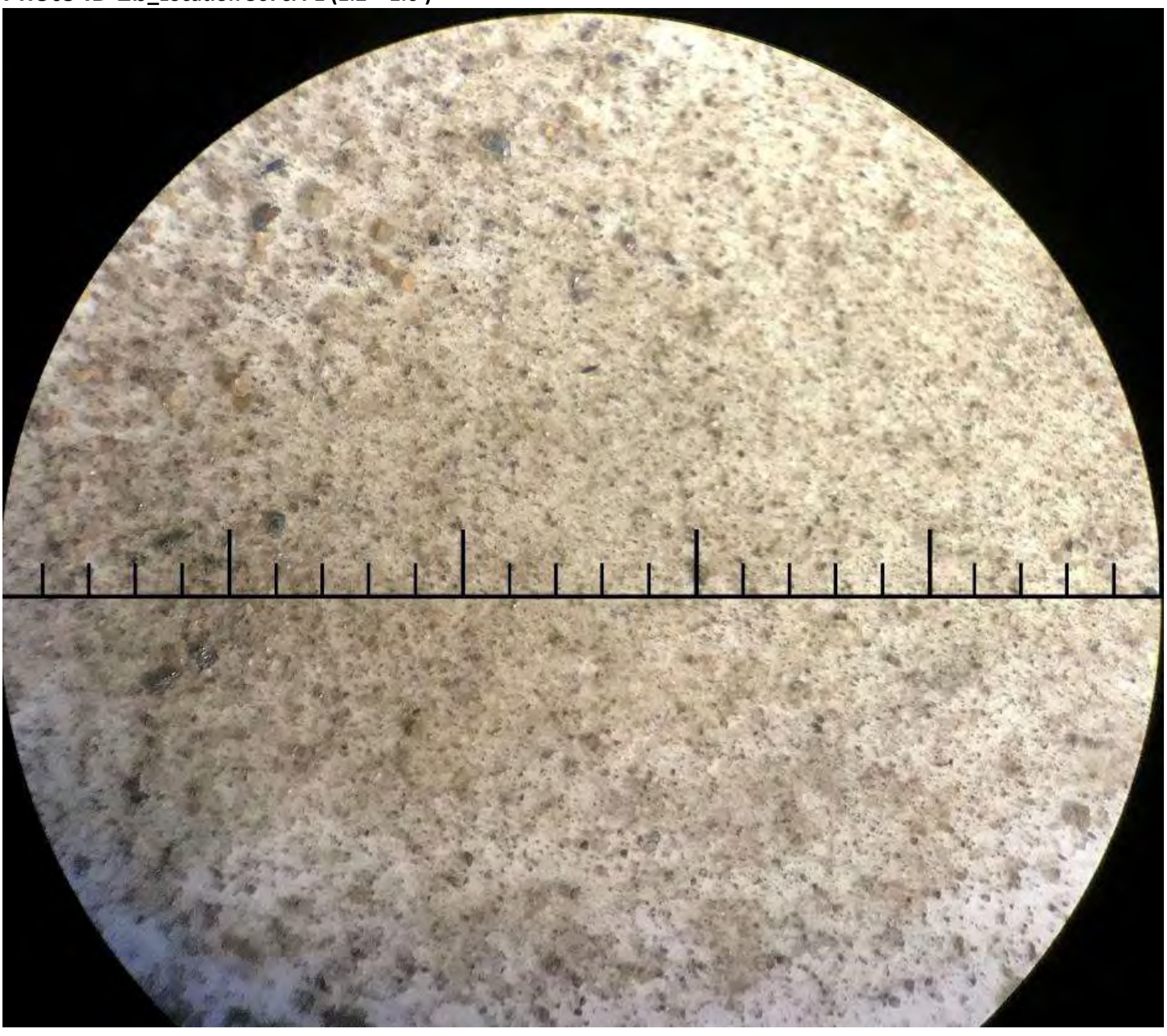


Photo ID 3a_Location 5076A-1 (1.6 –2.0’)

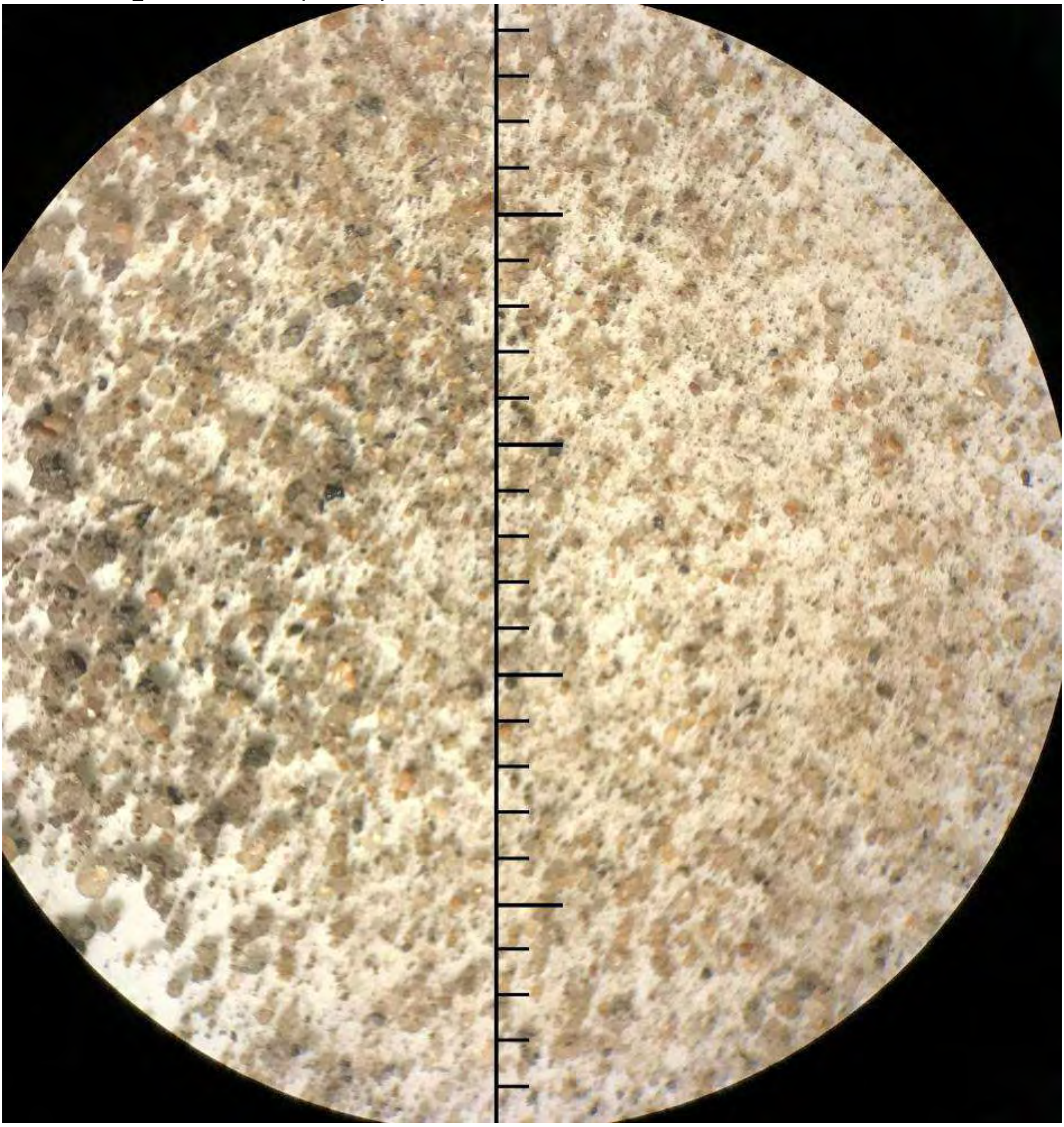


Photo ID 3b_Location 5076A-1 (2.0 – 2.1')

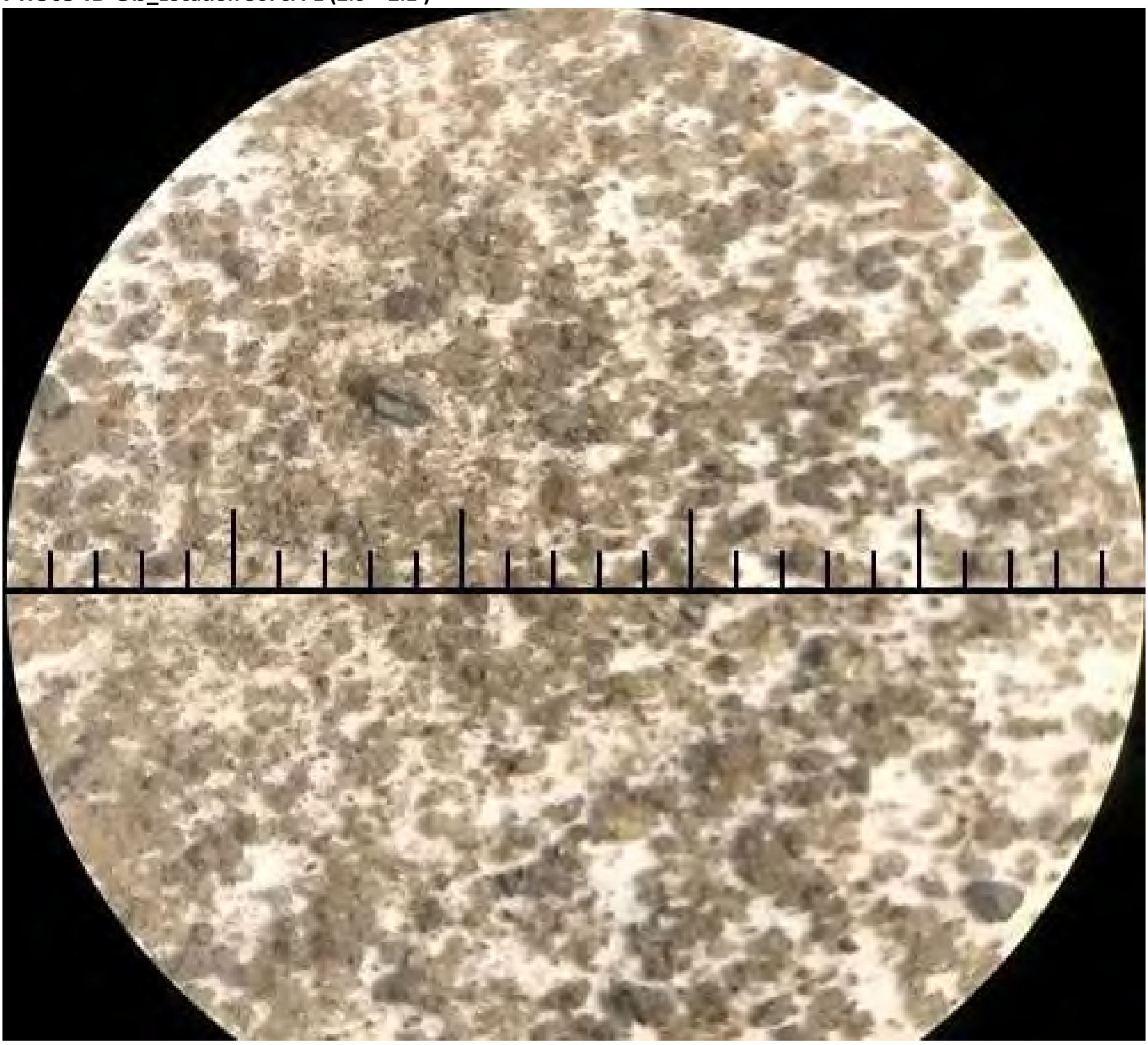


Photo ID 3c_Location 5076A-1 (2.1 – 3.0')

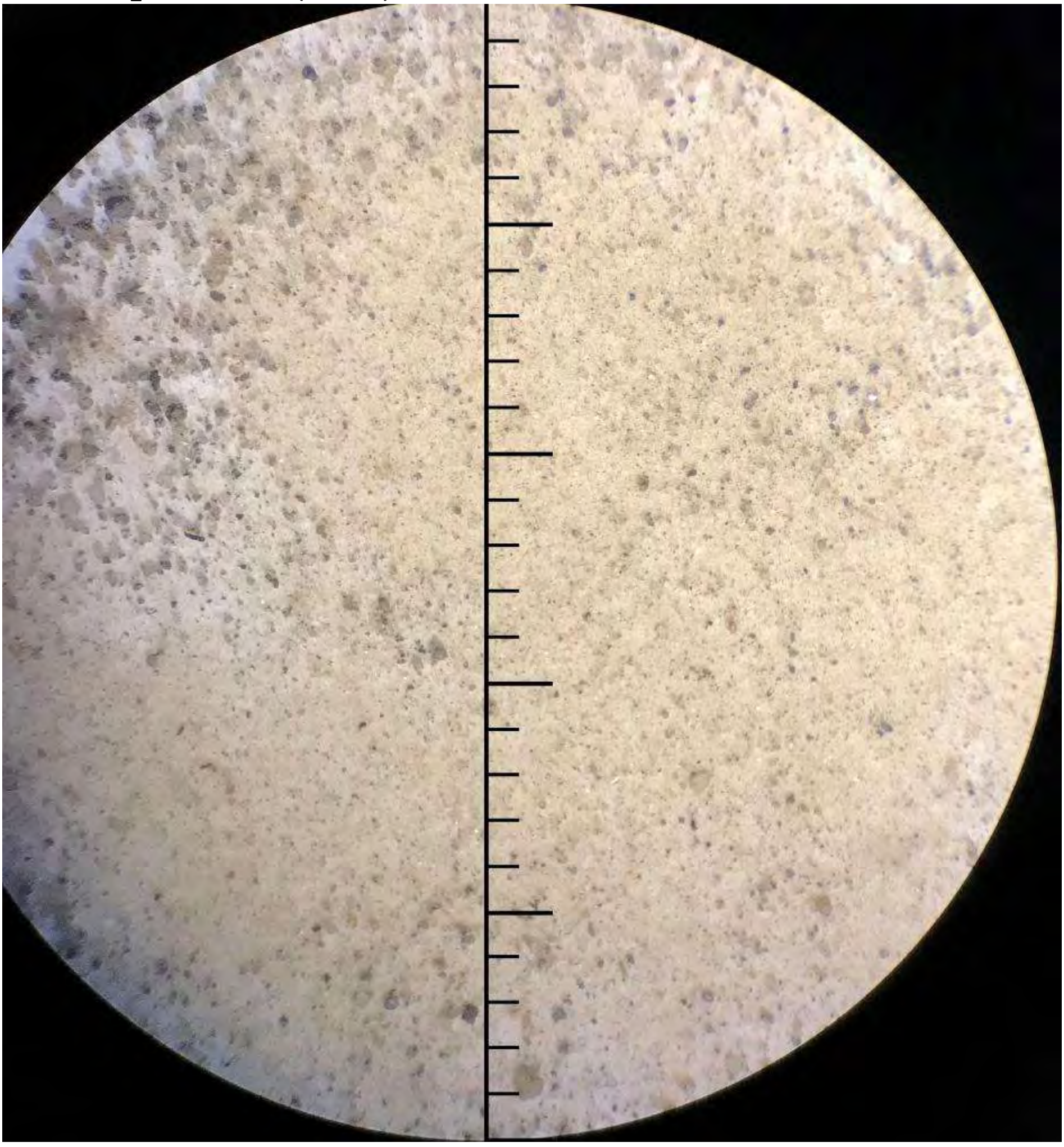


Photo ID 4_Location 5076A-1 (3.0 – 3.1')

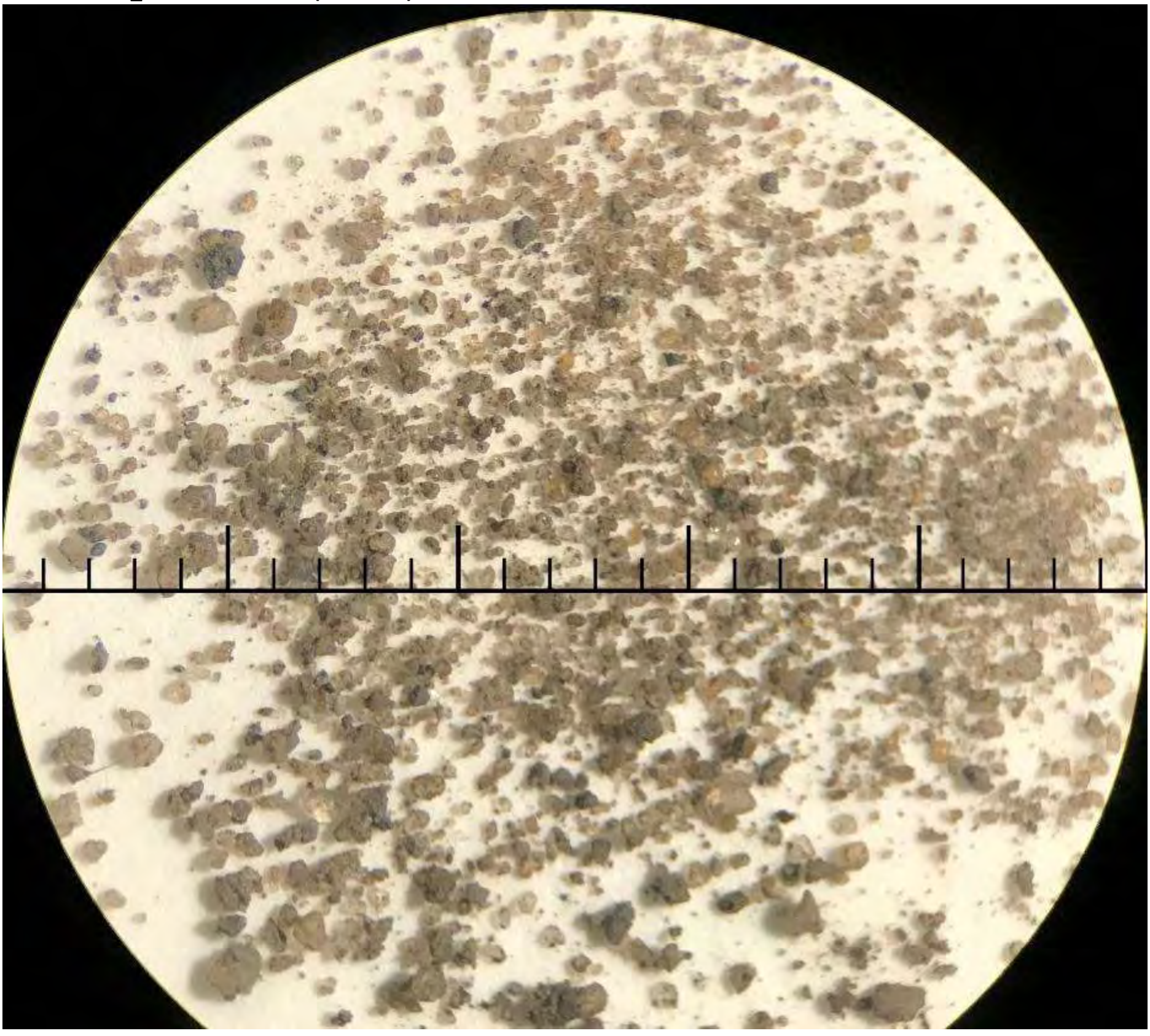


Photo ID 5a_Location 5076-5N (1.0 – 1.6')

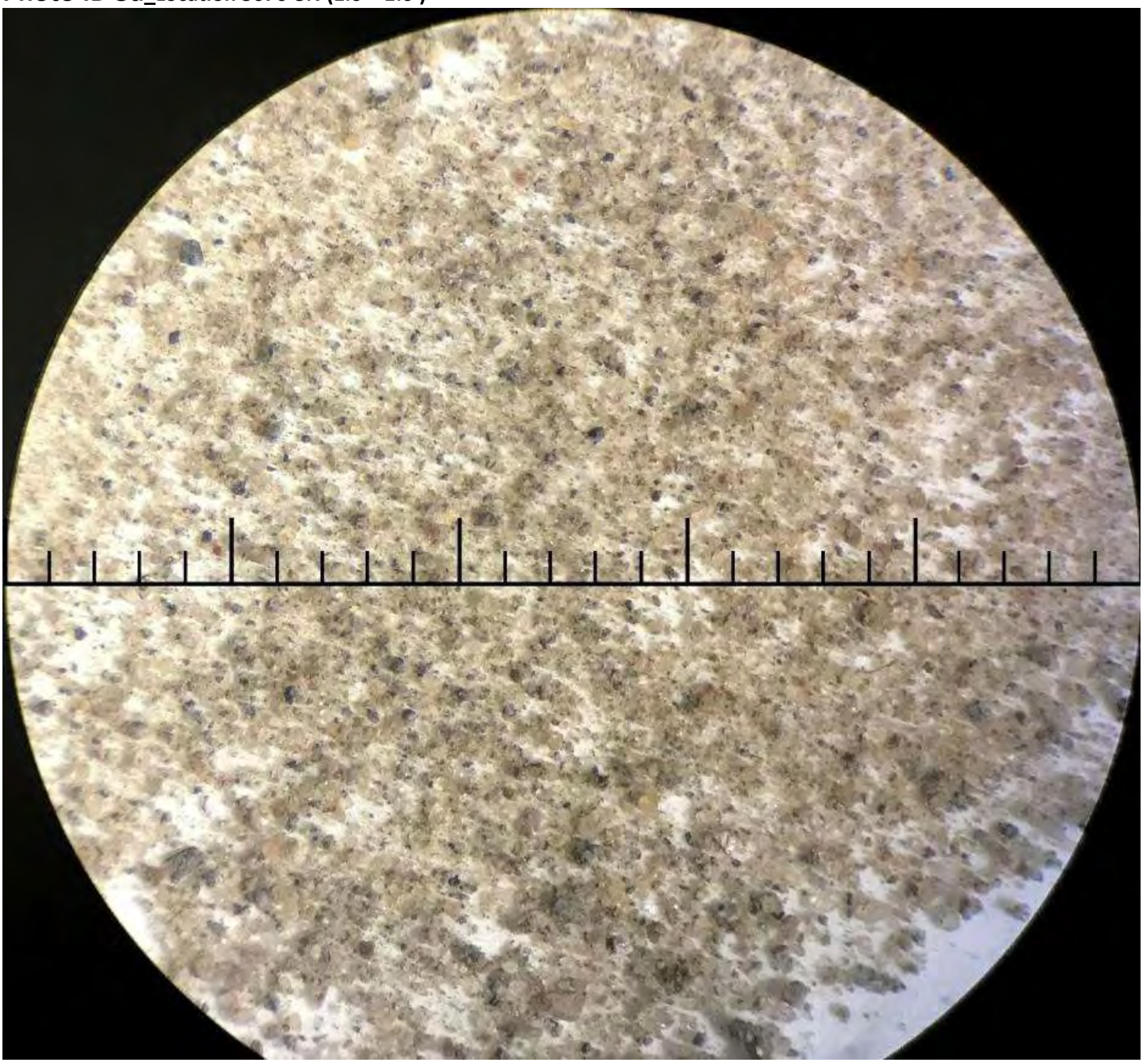


Photo ID 5b_Location 5076-5N (1.6 – 2.0')

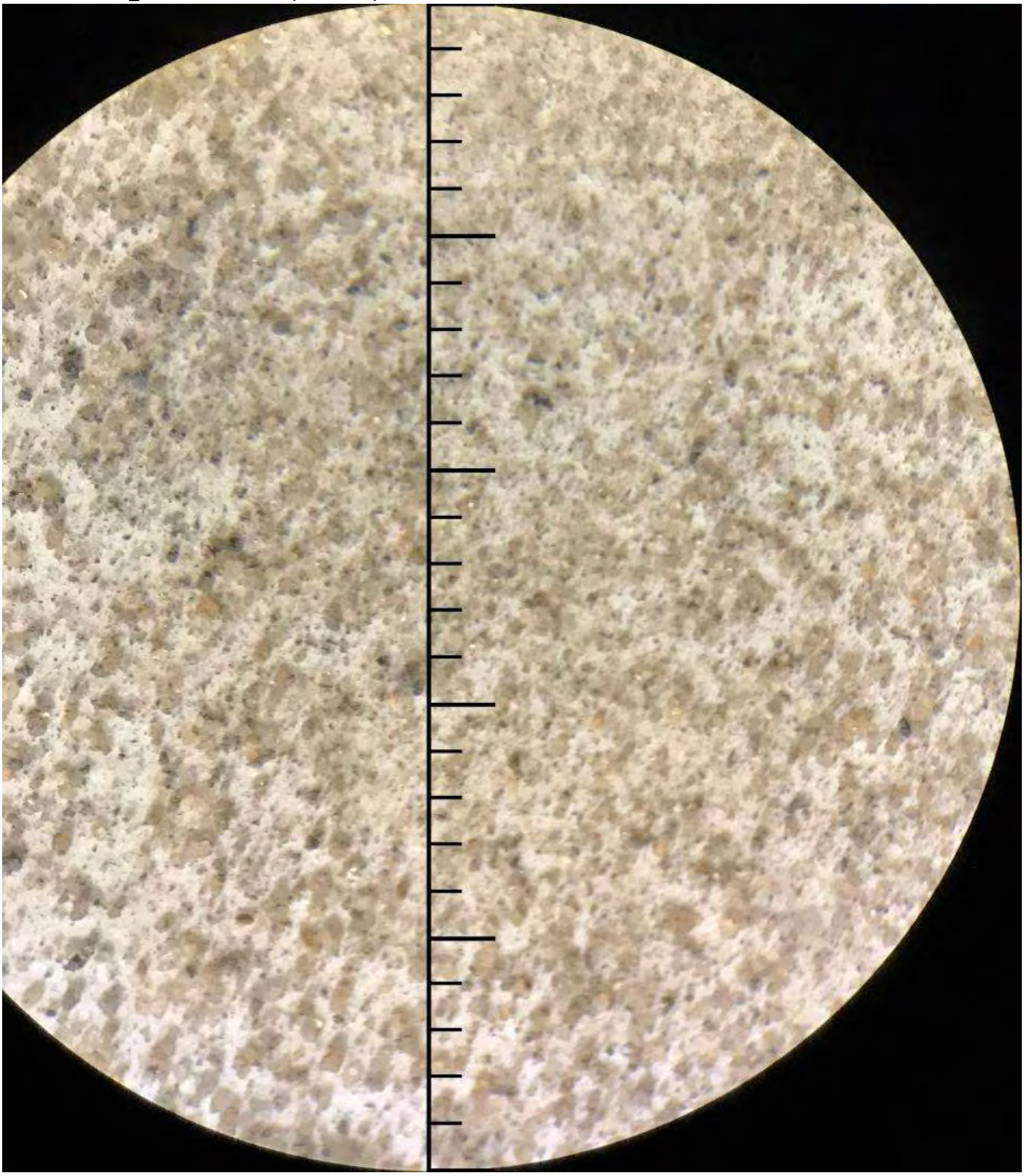


Photo ID 6_Location 5076-5N (2.0 – 2.5')

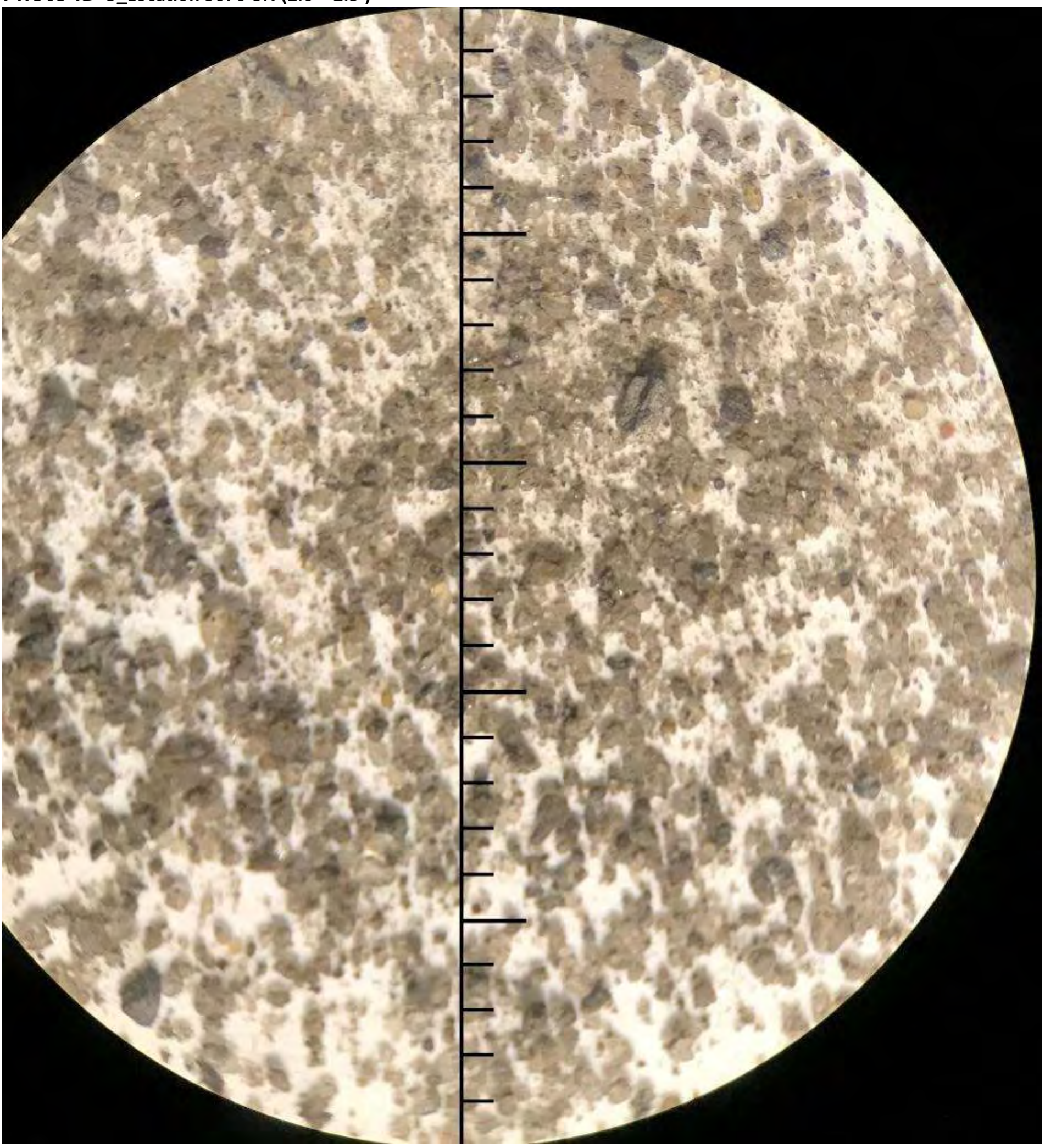


Photo ID 7_Location 5076-5E (1.3 – 2.0')

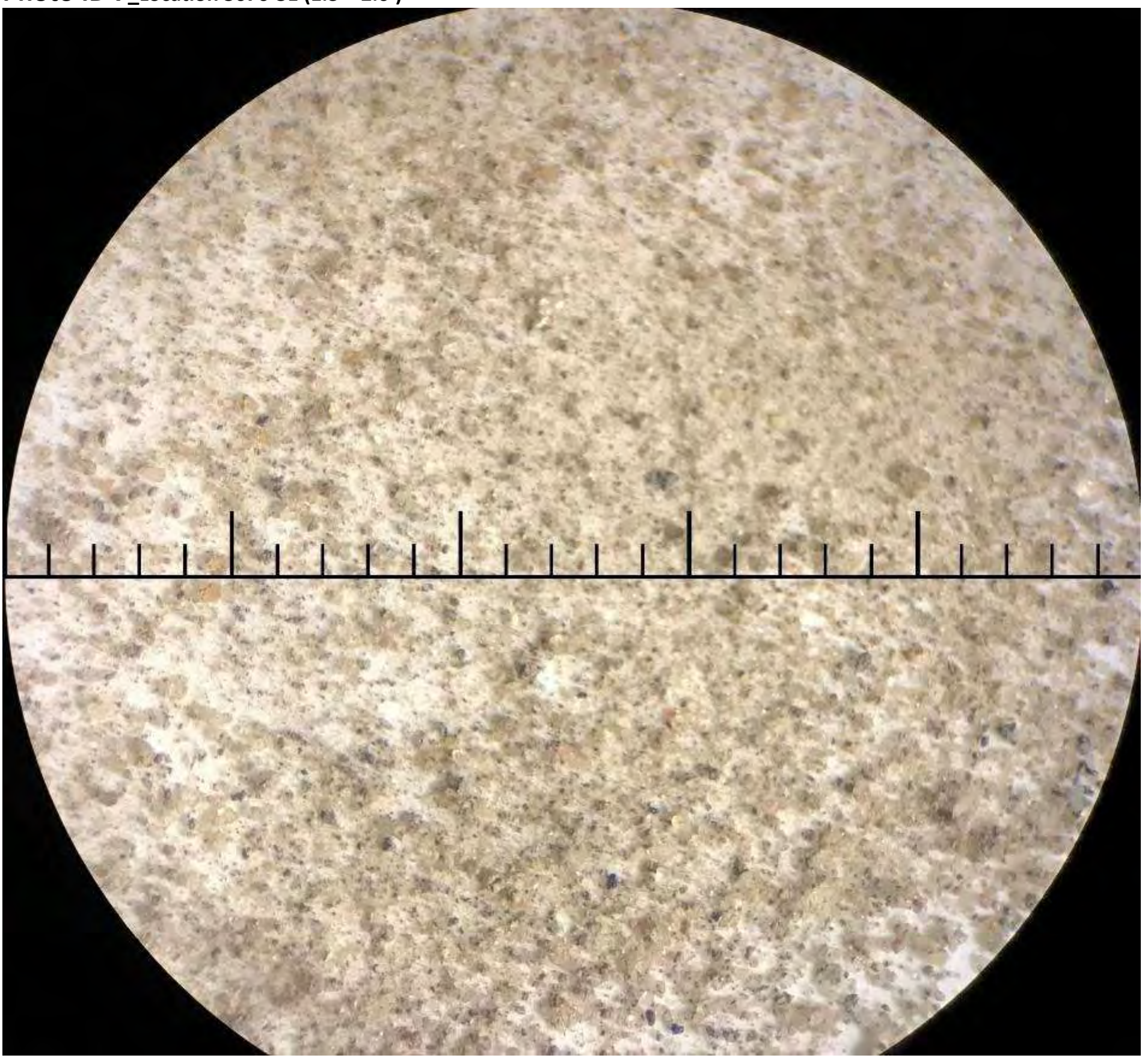


Photo ID 8_Location 5076-5E (2.0 – 3.0')

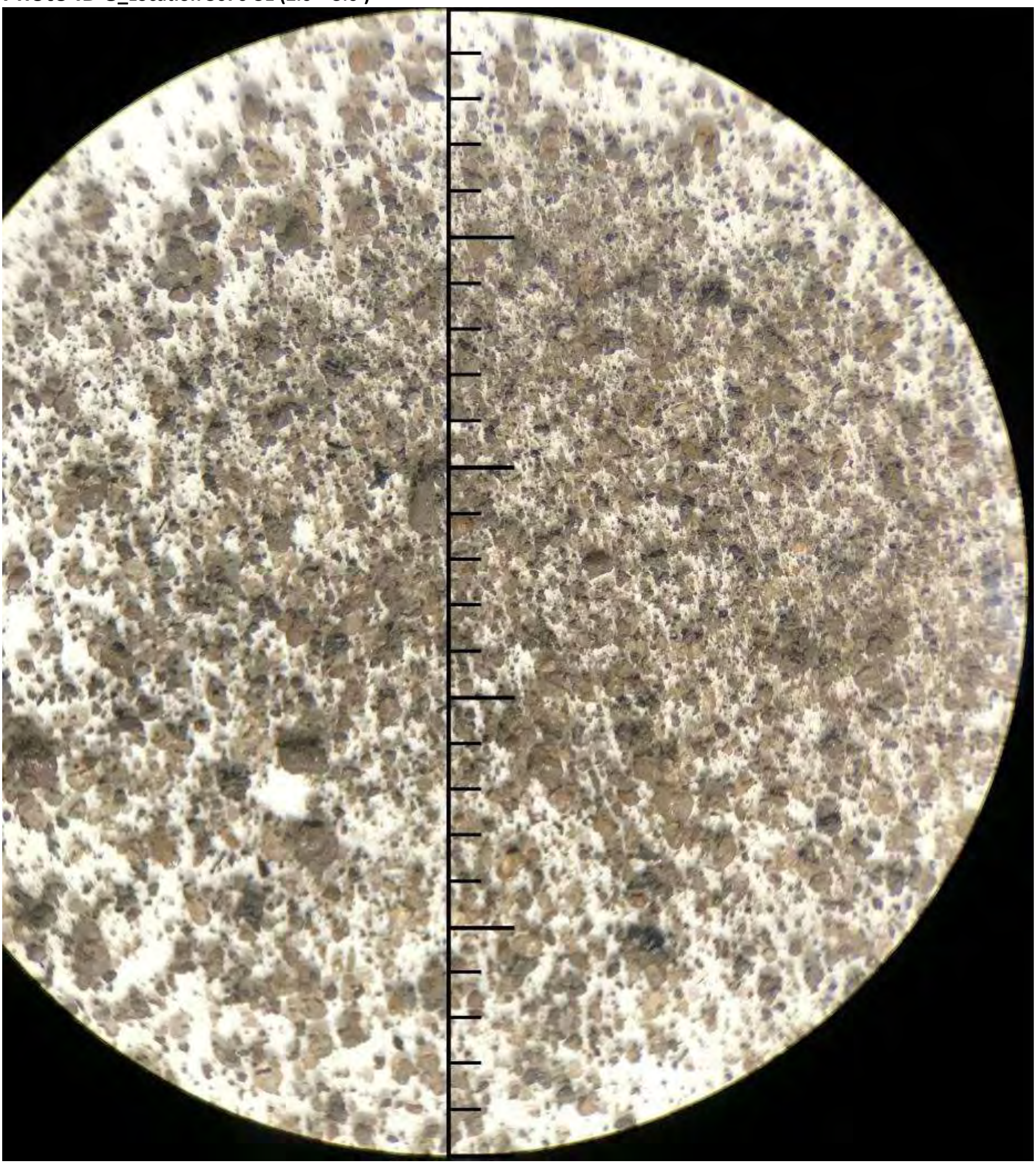


Photo ID 9_Location 5076-5W (1.2 – 1.8')

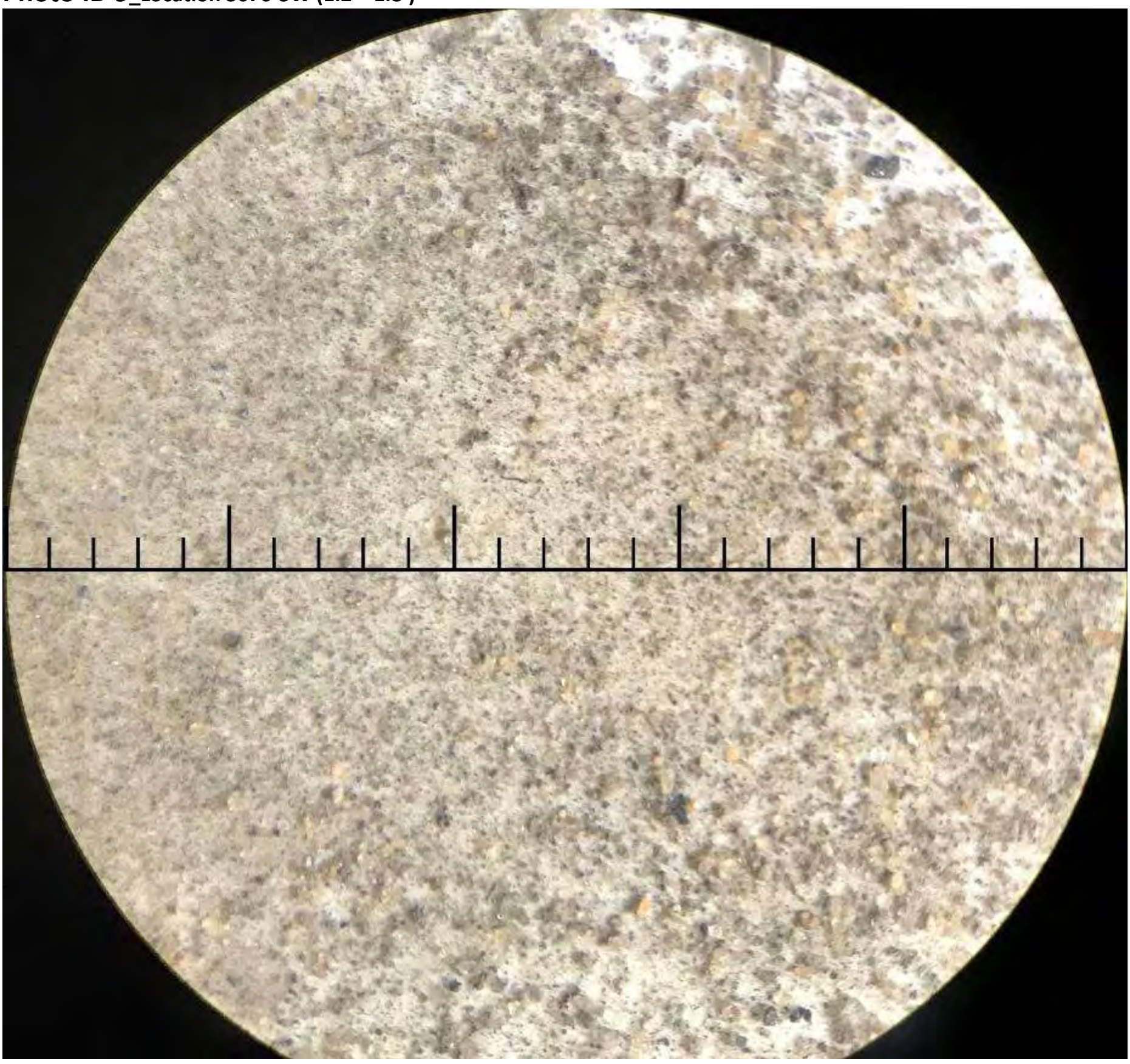


Photo ID 10_Location 5076-5W (1.8 – 2.3')

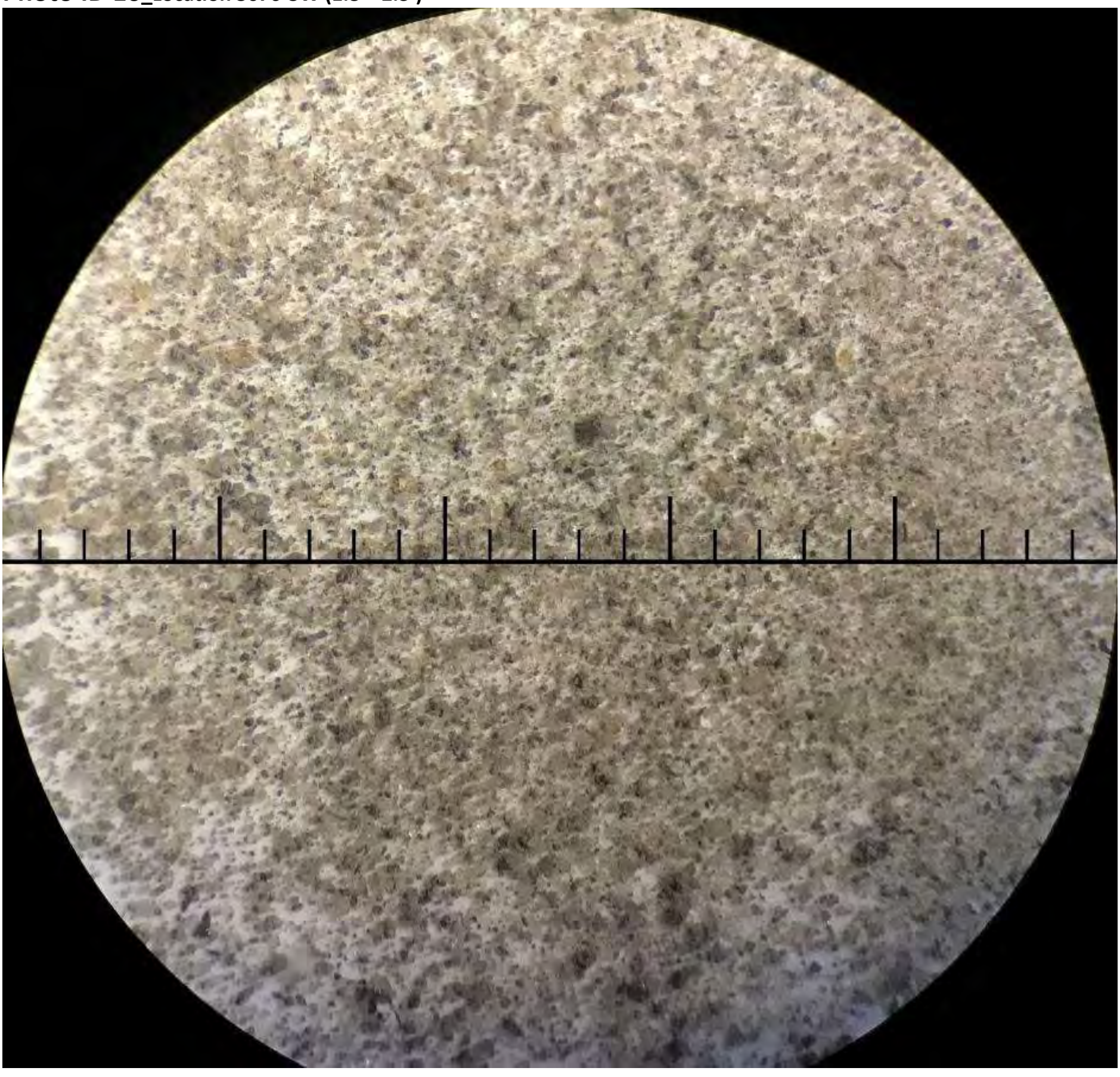


Photo ID 11_Location 5076-5W (2.3 – 2.6')

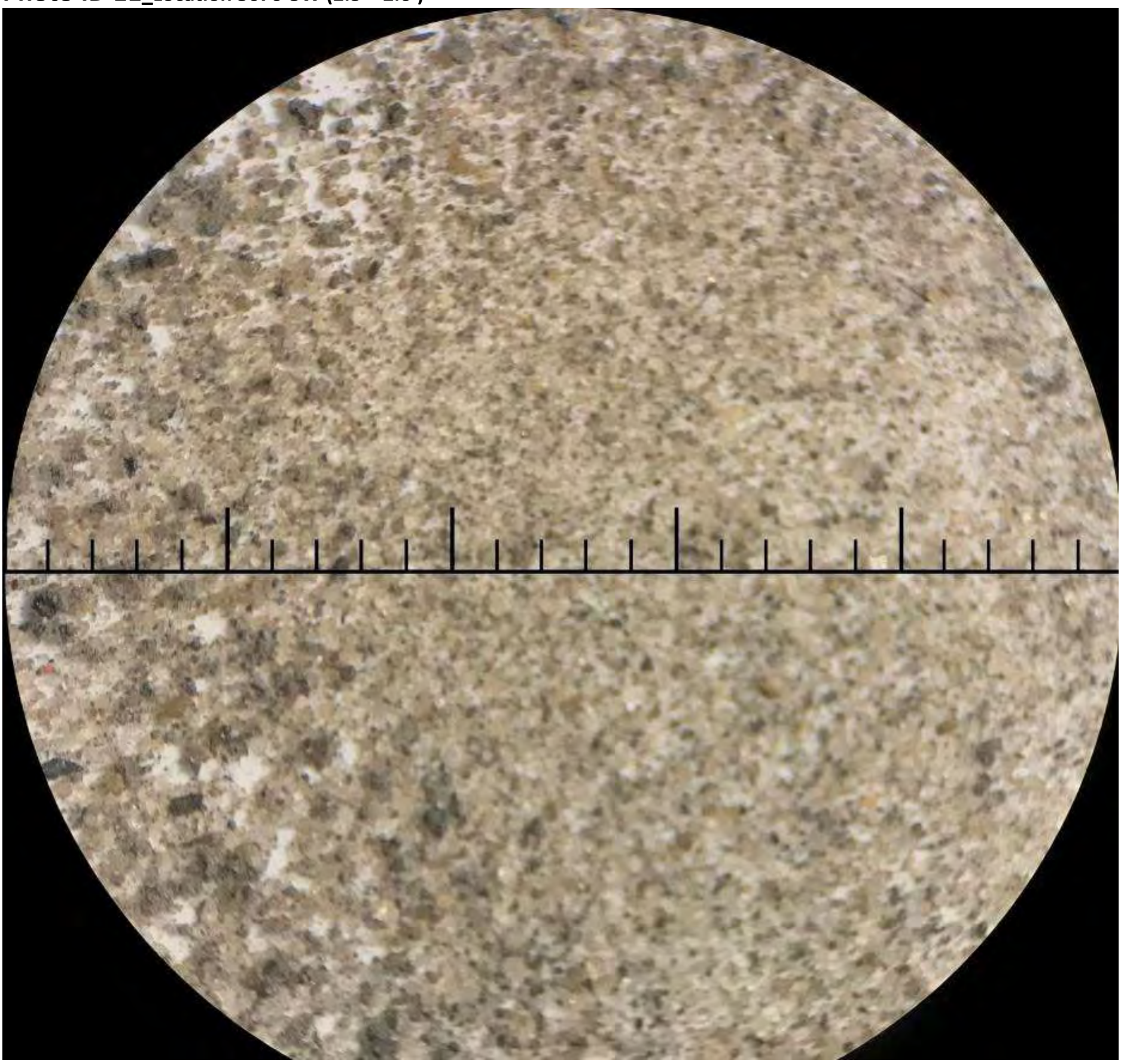


Photo ID 12_Location 5076-5W (2.6 – 3.0’)

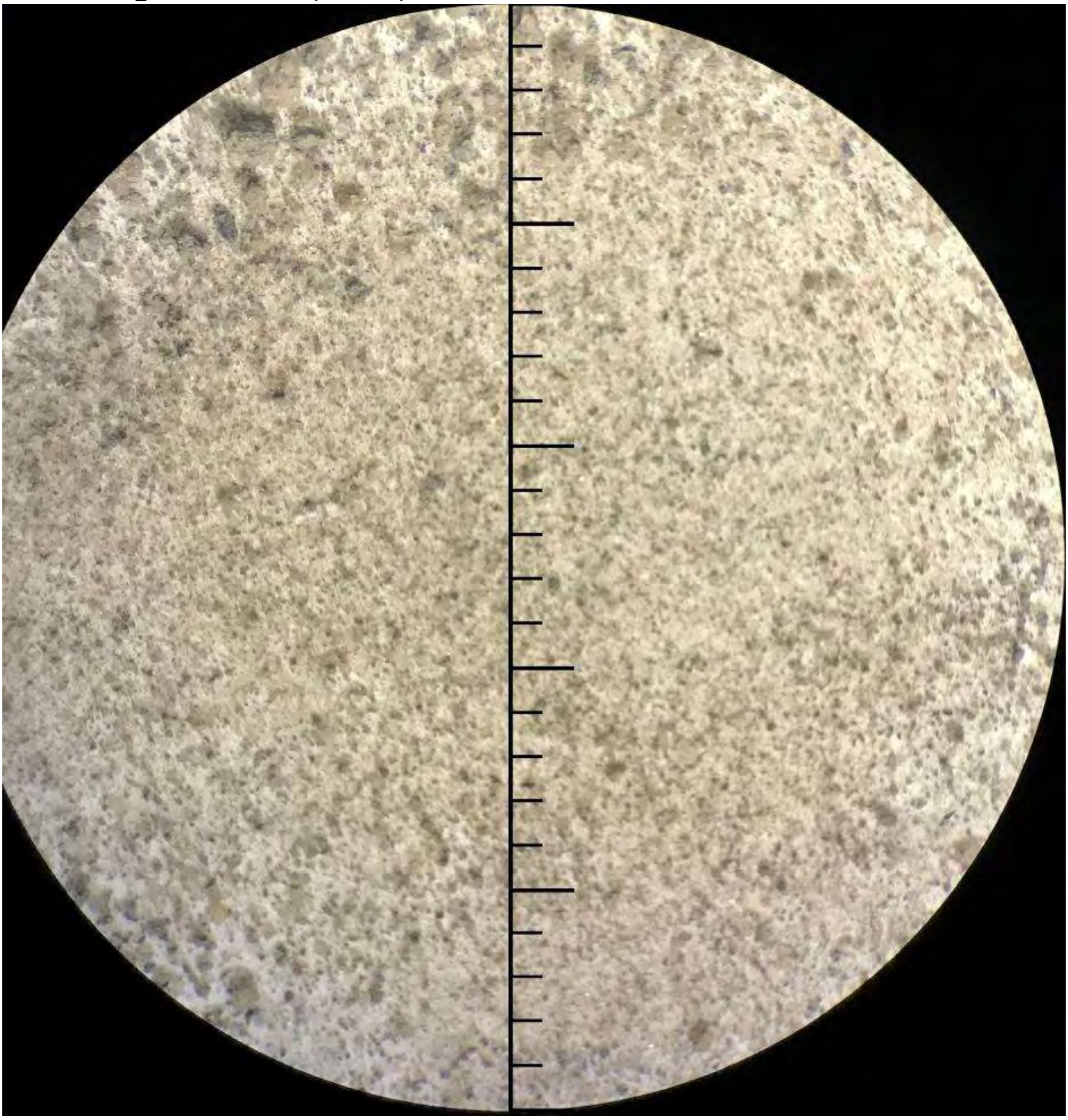
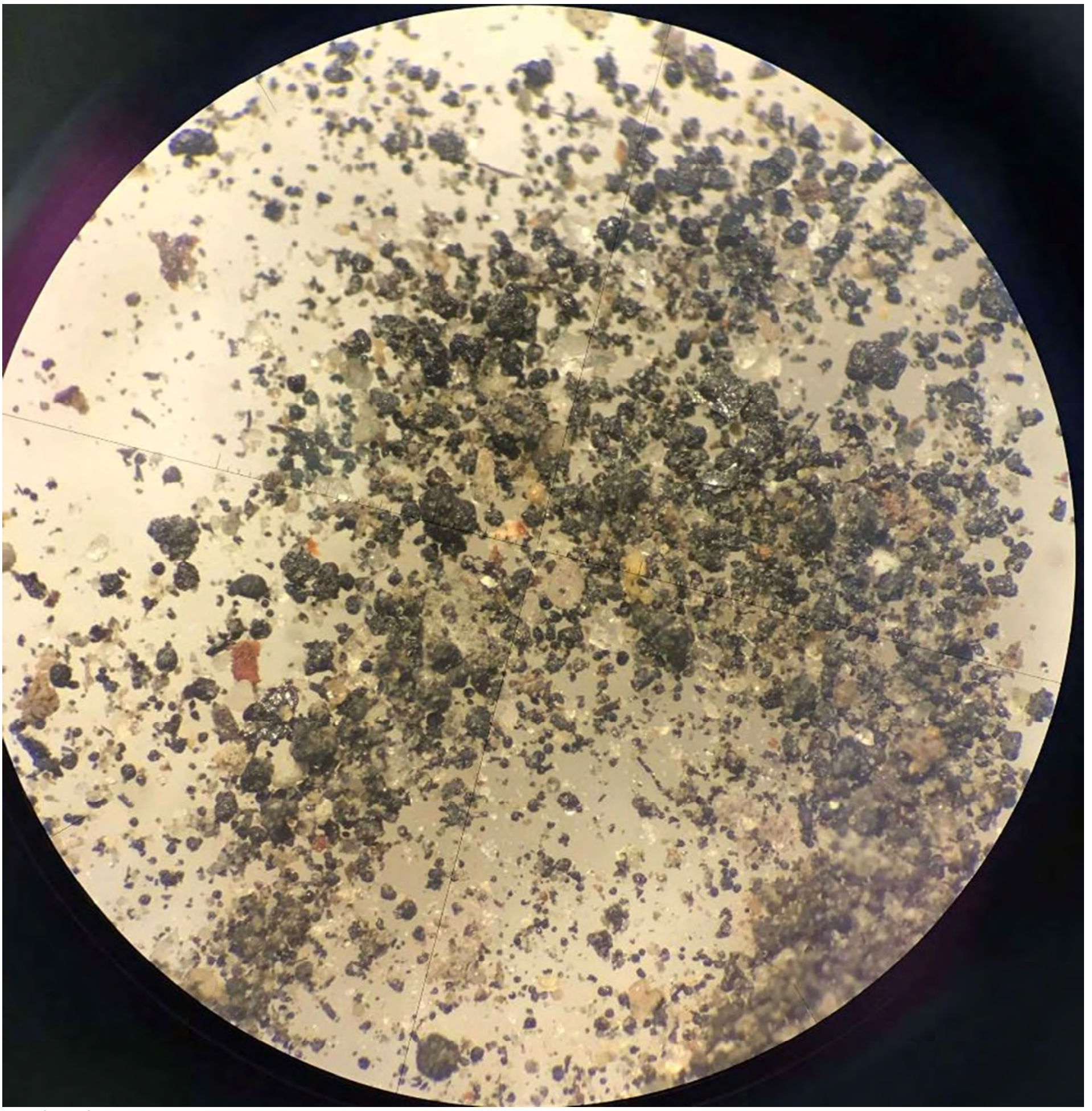
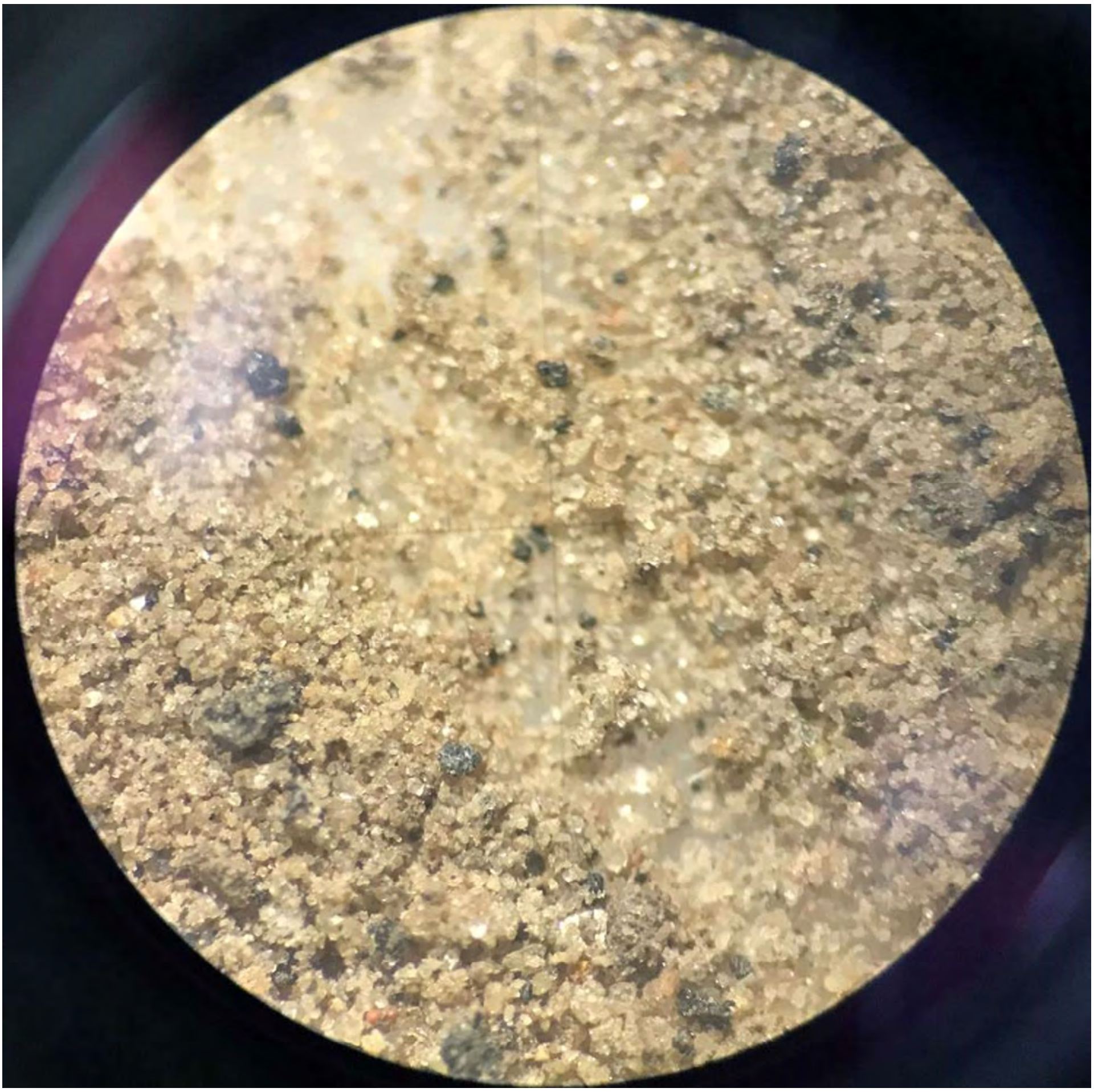


Photo ID – CCR from JDY – field of view is 5.5 mm across



Ash – field of view is 5.5 mm

Photo ID – prepared 5% CCR from JDY sand mixture – field of view is 5.5 mm across



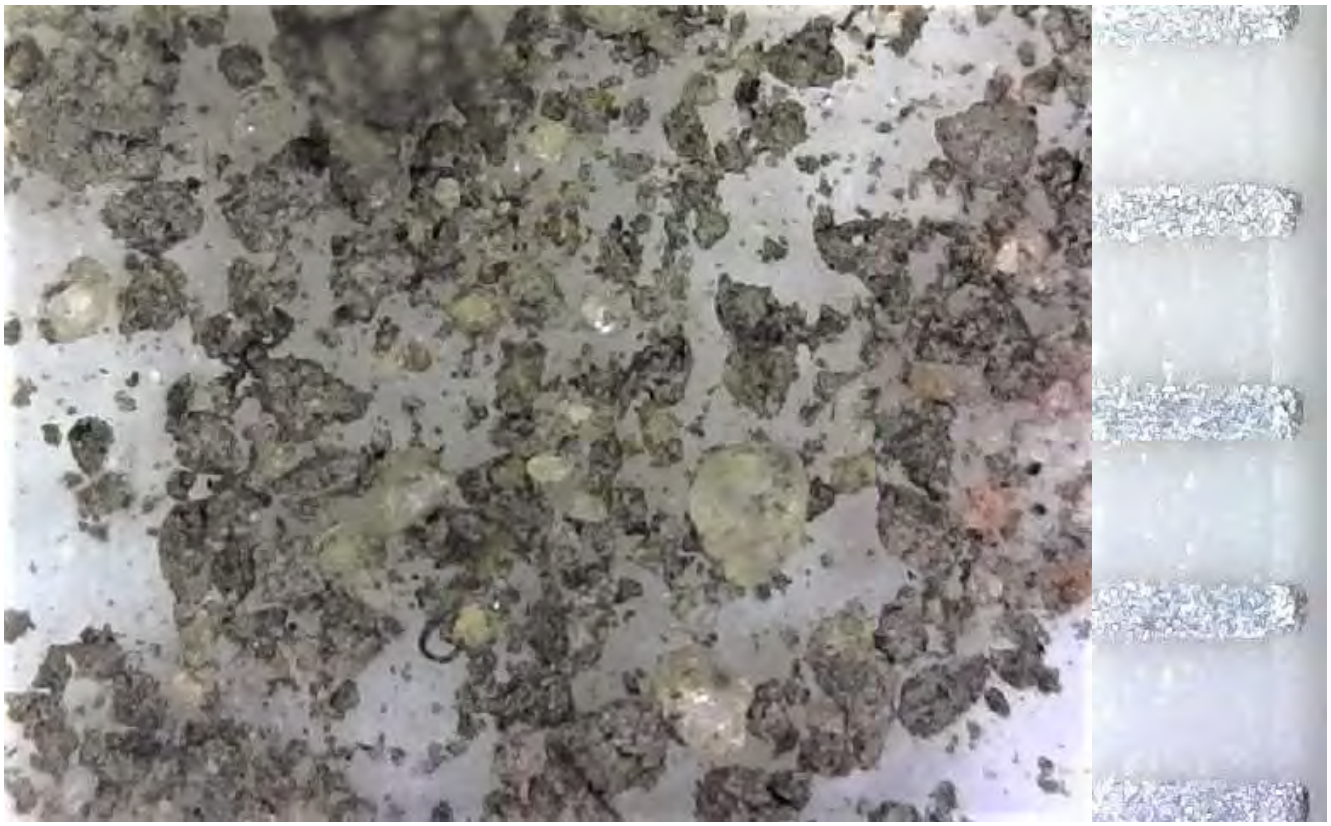
ATTACHMENT VI

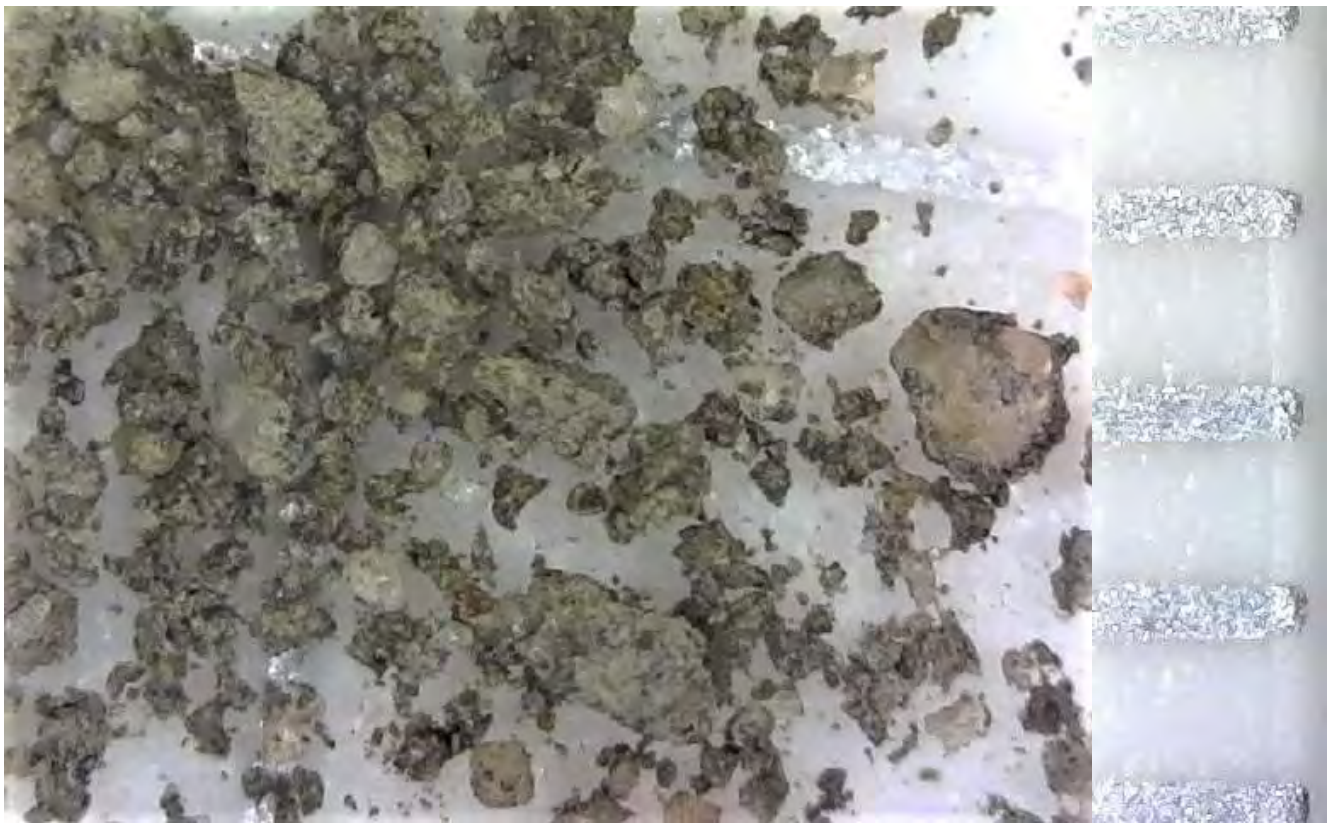
PHOTOGRAPHS OF USB MICROSCOPE EVALUATION

The individual markings on the scale shown represents one mm; thus the vertical dimension is approximately 4 mm.

Soil from Sample Location 5076-1 (2-2.75')

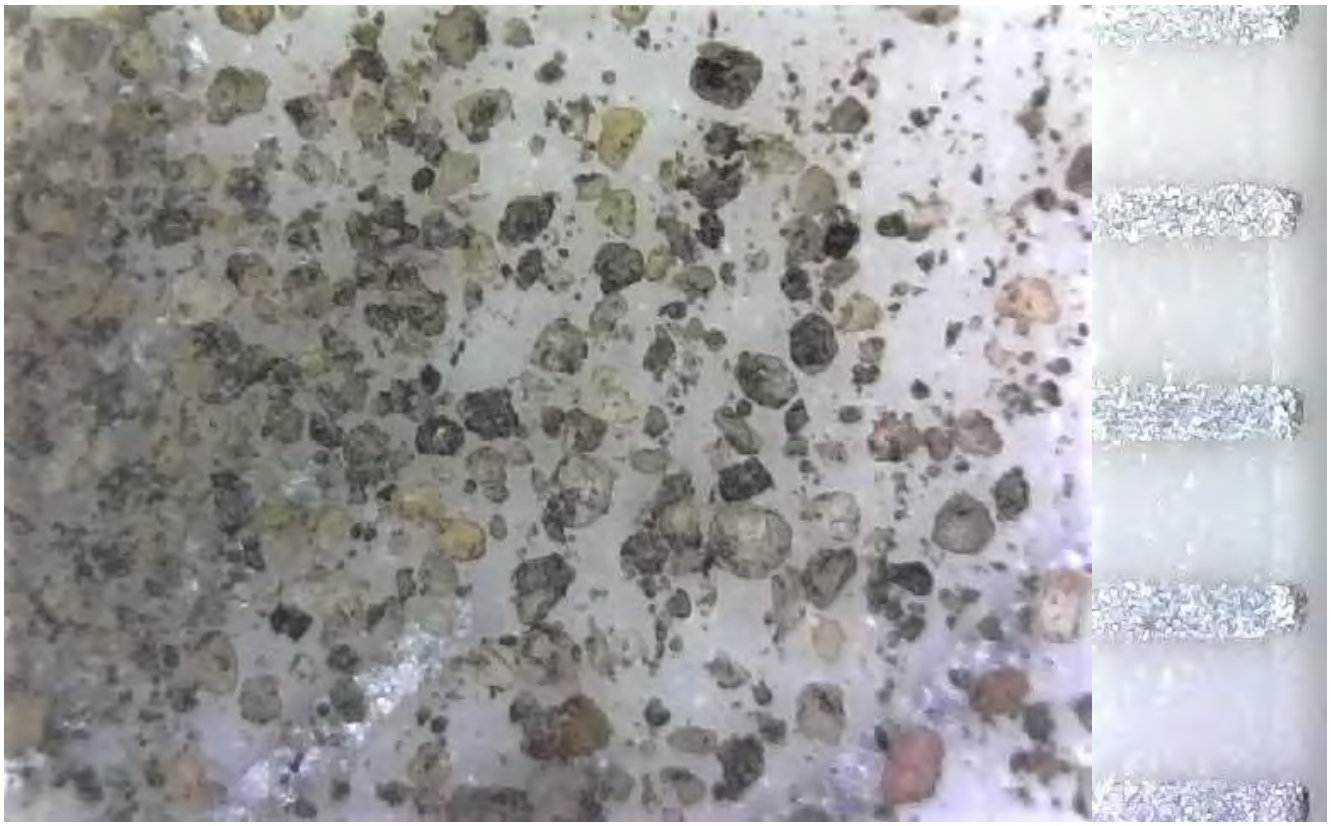
[Scale marks are each 1 mm]

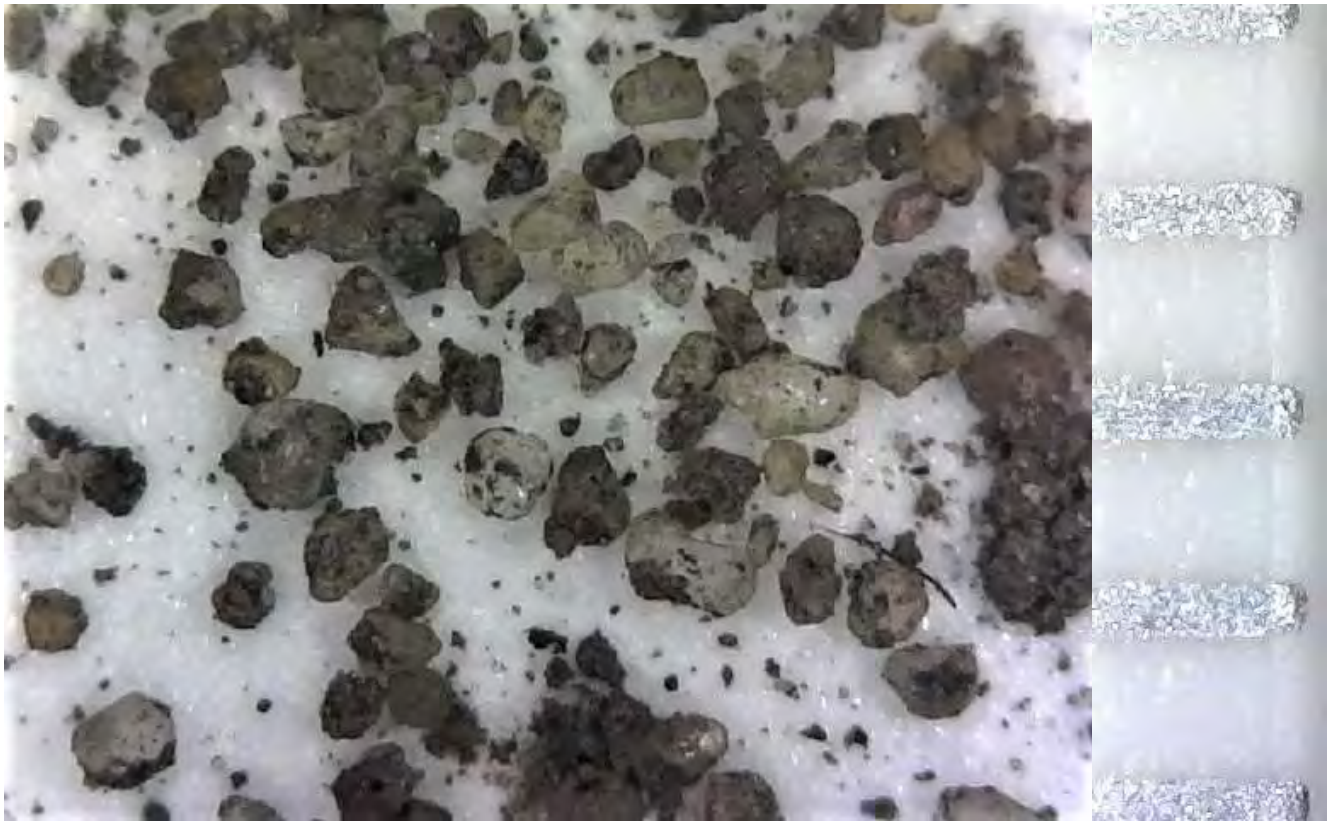




Soil samples from Location 5076A-1 (1.0 – 1.2')

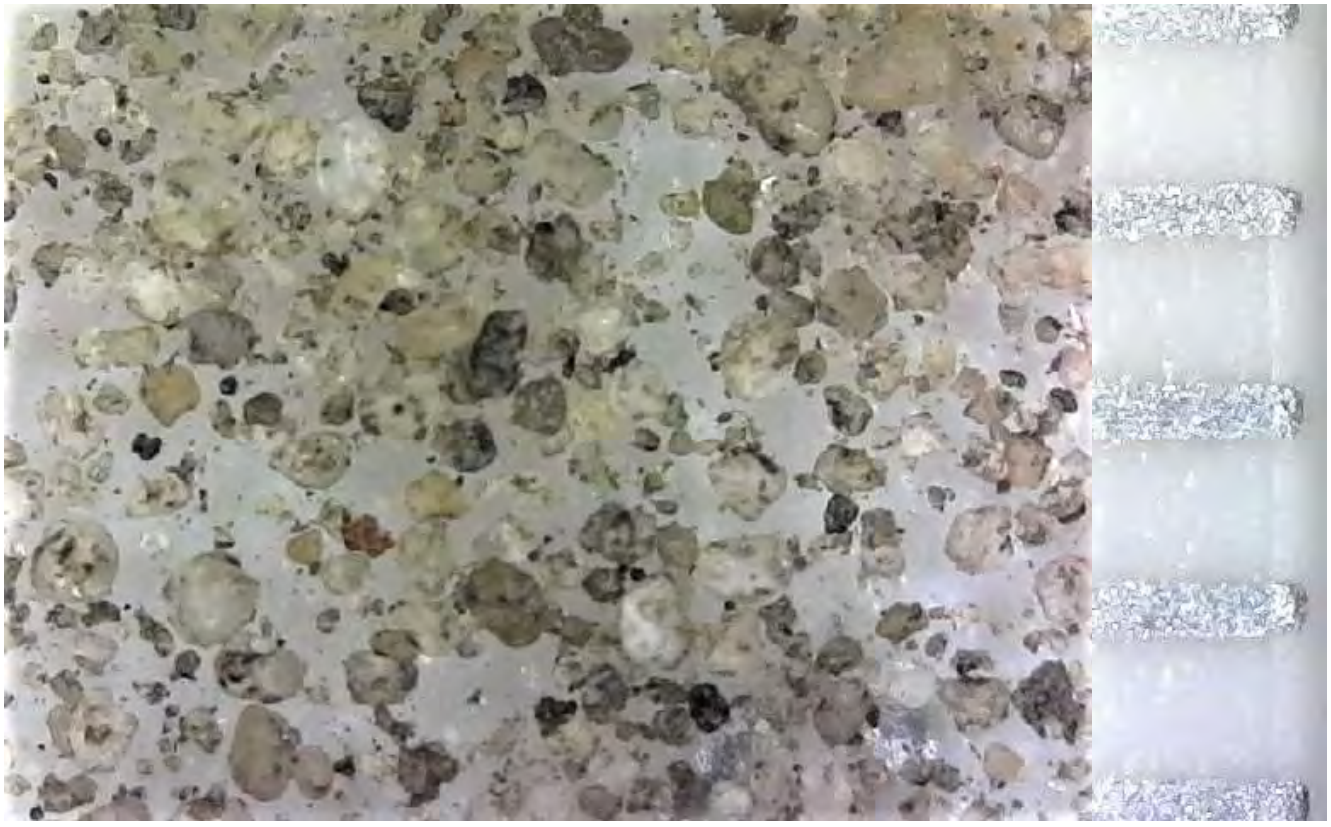
[Scale marks are each 1 mm]





Soil from Sample Location 5076A-1 (1.2 – 1.6')

[Scale marks are each 1 mm]



Soil from Sample Location 5076A-1 (1.6 –2.0’)

[Scale marks are each 1 mm]

ATTACHMENT B

MDEQ Approval Letter – April 11, 2019

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
GRAND RAPIDS DISTRICT OFFICE

GRETCHEN WHITMER
GOVERNOR

LIESL EICHLER CLARK
DIRECTOR

April 11, 2019

Ms. Jane Monroe
Holland BPW
625 Hastings Avenue
Holland, Michigan 49423

Dear Ms. Monroe:

SUBJECT: Bottom Ash Ponds 1-3 CCR and Former Coal Pile Removal Documentation Report, Holland BPW James DeYoung Powerplant, Ottawa County

Staff of the Department of Environmental Quality (DEQ) have reviewed the Bottom Ash Ponds 1-3 CCR and Former Coal Pile Removal Documentation Report that was submitted on January 9, 2019 and amended on March 9, 2019 and March 25, 2019. Based on observations made by DEQ staff during the removal process and the report, the DEQ concurs with Holland BPW that the bottom ash in Ponds 1-3 and the coal pile has been removed and multiple lines of evidence of the removal has been documented.

This certification approval is simply for removal of the coal waste and bottom ash that is a regulated solid waste under Part 115-Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This certification approval does not in any way constitute an approval under the Disposal of Coal Combustion Residuals from Electric Utilities Final Rule (CCR Rule).

The DEQ understands that Holland BPW is currently performing hydrogeologic monitoring as required under the CCR Rule. The DEQ has addressed specific concerns with the groundwater monitoring network separately.

If you have any questions, please contact me at 616-356-0229.

Sincerely,

Timothy J. Unseld, Environmental Engineer
Grand Rapids District Office
Waste Management and
Radiological Protection Division

TU:kw

cc: Ms. Trista Gregorski, Holland BPW
Mr. Brad Venman, NTH Consultants
Ms. Christine Veldkamp, DEQ
Ms. Margie Ring, DEQ (via e-mail)
Mr. Fred Sellers, DEQ
Mr. Kent Walters, DEQ