APPENDIX B

Well Installation and Aquifer Testing Report

Appendix B Supplement
Rationale for Input Parameters - Aquifer Test Data Evaluation
Hercules LLC/Pinova Inc Facility
Brunswick, GA

In response to Comment No. 46 received on October 20, 2021, from the EPD, the rationale for each of the input parameters used in the aquifer test data evaluation are provided below to supplement Appendix B.

AQTESOLV Input Parameter	Input Parameter Value (APT-1)	Rationale for Selection of Input Parameter Value
Aquifer Saturated Thickness (ft) [AQTESOLV "b"]	65	Based on APT-01 boring log, the saturated thickness is 65 ft, starting from bottom of Sandy lean CLAY (approximately 30 ft bgs) to top of Sandy SILT (approximately 90 ft bgs).
Pumping Rates (gpm)	8 / 12 / 15 / 25 / 35	Based on field observation and technical judgement, the five pumping rates were selected to evaluate the performance of APT-01 under the various discharge rates.
Hydraulic Conductivity Anisotropy Ratio [AQTESOLV "Kv/Kh"]	0.1	Based on observed 65 ft thick continuous poorly graded sand, 0.1 anisotropy ratio was estimated. Values of Kv/Kh for alluvium could range between 0.1 and 0.5 (Todd, 1980). In addition, aquifer anisotropy sensitivity was evaluated by increasing the anisotropy ratio from 0.1 to 1.0.
Well Configuration	Partial Penetration	Partial Penetration was selected because APT-01 only screens a portion (20 ft) of the saturated aquifer thickness (65 ft).
Depth to Top of Screen [AQTESOLV "d"]	45	Based on APT-1 boring log, d is the length from bottom of Sandy lean CLAY (semiconfining to confining unit) to top of APT-01 well screen.
Screen Length (ft) [AQTESOLV "L"]	20	Length of APT-01 well screen
Casing Radius (ft) [AQTESOLV "r(c)"]	0.25	Inner radius of 6-inch well casing (APT-01)
Well Radius (ft) [AQTESOLV "r(w)"]	0.25	Radius of the 6-inch perforated interval (APT-01 well screen)
Equipment Radius (ft) [AQTESOLV "r(eq)"]	0.083	Radius of downhole equipment (submersible pump attached to 2-inch steel rod)

Notes:
ft - feet
ft bgs - feet below ground surface
Todd, D.K., 1980. *Groundwater Hydrology* , 2nd ed., John Wiley & Sons, New York, 535p.

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WELL INSTALLATION AND AQUIFER TESTING REPORT

HERCULES/PINOVA FACILITY
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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

1.1 Introduction and Background

This Well Installation and Aquifer Testing Report was prepared on behalf of Hercules, LLC ("Hercules") by Geosyntec Consultants, Inc. ("Geosyntec"). Well installation and aquifer testing activities were performed at an industrial facility located at 2801 Cook Street in Brunswick, Glynn County, Georgia (the "Brunswick facility" or "Site"). The Brunswick facility consists of approximately 322 acres of real property, portions of which are owned by Hercules and portions of which are owned by Pinova, Inc. ("Pinova"). Site features and the locations of the groundwater monitoring well network are shown on **Figure 1**.

The aquifer testing program consisted of installation of one pumping well (APT-01) and two observation wells (PWOW-01 and PWOW-02) in the study area (**Figure 2)**, completion of a step-drawdown and aquifer recovery test, and aquifer test data evaluation. Well installation activities were completed between February 26, 2020 and March 6, 2020. The step-drawdown test was completed on March 12, 2020. This report provides details of the well installation and step-drawdown test procedures, and data evaluation results.

1.2 Objectives

The Brunswick facility is subject to Hazardous Waste Permit No. HW-052 (D&S), which requires implementation of groundwater monitoring and corrective action at the Site pursuant to the Resource Conservation and Recovery Act ("RCRA"). The aquifer testing was performed to evaluate aquifer properties to inform the evaluation of potential interim corrective measures (ICMs), as well as potential long-term remedial options, to address groundwater in the deep zone of the upper surficial aquifer beneath portions of the facility. Key information developed from the aquifer testing are summarized below:

- ***Well Performance and Efficiency* –** Results from the step-drawdown portion of the program can be used to evaluate the performance and efficiency of the extraction well APT-01.

- ***Aquifer Parameters* –** Results from the testing can be used to estimate the *in-situ* horizontal hydraulic conductivity (K_h), effective porosity (n_e), groundwater

velocity (V), and storativity (S) of the deep zone of the upper surficial aquifer in the study area.

- ***Radius of Influence*** **–** Results from the testing program provide information regarding the anticipated radius of influence (ROI) during pumping of well APT-01, and the anticipated shape of the drawdown cone induced by groundwater extraction.

- ***Groundwater Quality*** – Laboratory analytical testing of groundwater samples collected from the APT-01 discharge during the step-drawdown test will be used to evaluate water quality.

Geosyntec conducted the step-drawdown test in general accordance with the Standard Operating Guideline 160 (General Pumping Test Procedures) provided in **Appendix A**.

2. SITE SETTING

A detailed description of the hydrologic, hydrogeologic and geologic setting at the Brunswick facility is provided in the *Groundwater Technical Summary Report* prepared by Antea Group ("Antea"), dated September 6, 2016; the *Refined Groundwater Conceptual Site Model* (CSM), prepared by Integral Consulting, Inc. ("Integral"), dated March 15, 2019; and the *Baseline Human Health Risk Assessment and Screening Level Ecological Risk Assessment*, prepared by NewFields LLC ("NewFields), dated March 22, 2019. A summary of key information as it pertains to the pumping well and observation well installation and aquifer testing activities completed between February and March 2020 is provided below.

2.1 Site Geology and Hydrogeology

Five aquifer units underlie the Brunswick area. These aquifer units, from shallowest to deepest, are as follows:

- Surficial aquifer (0 – 200 feet below ground surface; [ft bgs])
- Upper Brunswick aquifer (280 – 355 ft bgs)
- Lower Brunswick aquifer (400 – 475 ft bgs)
- Upper Floridan aquifer (500 – 970 ft bgs)
- Lower Floridan aquifer (1,000+ ft bgs)

The unit of interest for this study is the surficial aquifer, which generally begins a few feet below the ground surface and is approximately 200 feet thick in the vicinity of the Site. The surficial aquifer consists of interlayered sand, clay, and thin limestone beds (Clarke et al. 1990). The surficial aquifer has been divided into the upper and lower surficial aquifer, with the generally unconfined upper surficial aquifer extending to a depth of 100 - 120 ft bgs. Clay layers/lenses within the surficial aquifer range from 5 - 40 feet in thickness, and, where laterally extensive, create semiconfined or confined conditions in the deeper portions of the upper surficial aquifer (Clarke et al. 1990). Aquifer tests in the Brunswick area have confirmed the presence of these deeper semiconfined or confined conditions (Clarke et al. 1990). The lower surficial aquifer extends to a depth of approximately 200 ft bgs and is semiconfined to confined in the eastern portion of the Site, meaning that it is at higher pressure than the overlying unconfined water table portion of the aquifer (Integral, 2019).

The upper surficial aquifer beneath the Site has been subdivided into shallow (0 – 40 ft bgs), intermediate (40 – 70 ft bgs), and deep zones (70 – 100 ft bgs). The upper surficial aquifer consists of interbedded clays, silts, sands, and channel deposits. In the western portion of the Site, where the majority of groundwater recharge occurs, the shallow, intermediate, and deep zones of the upper surficial aquifer consist primarily of sands. In the eastern portion of the Site, including the area of interest for this study, discontinuous clay lenses separate the shallow, intermediate, and deep zones of the upper surficial aquifer, and aquifer materials generally become coarser with depth.

Based on potentiometric surface contour maps utilizing multiple rounds of groundwater elevation measurements (as presented in semi-annual groundwater monitoring reports prepared by Antea and submitted to Georgia Department of Environmental Protection Division ["EPD"]), the prevailing direction of groundwater flow in the upper surficial aquifer beneath the Brunswick facility is generally to the east-southeast, with local variations due to heterogeneities in the aquifer (i.e., zones of highly permeable subsurface materials compared to zones of relatively impermeable subsurface materials). A local groundwater high exists in the western portion of the Brunswick facility due to freshwater recharge from precipitation. A downward hydraulic gradient exists beneath the central and western portions of the Brunswick facility such that releases to groundwater from historic operations at the Brunswick facility in these areas have migrated vertically to the deep zone of the upper surficial aquifer and then laterally in a generally east-southeast direction. The upper surficial aquifer consists of freshwater to the west of the Brunswick facility and grades to brackish to saline groundwater beneath the salt marsh to the east of the Brunswick facility.

The water table depth and the corresponding vadose zone thickness at the Brunswick facility varies, on average, between 1 - 10 ft bgs, with decreasing vadose zone thickness from west to east. As described in the *Revised Groundwater CSM* (Integral, 2019), a tidal study documented tidal influence on groundwater elevations across all three zones of the upper surficial aquifer beneath the Brunswick facility. Tidal influence was most pronounced in groundwater monitoring wells in the intermediate and deep zones of the upper surficial aquifer (approximately 0.05 to 0.15 ft of influence), with less influence on water table elevations in the shallow zone of the upper surficial aquifer (less than 0.05 ft of influence) beneath the Brunswick facility.

3. WELL INSTALLTION AND DEVELOPMENT ACTIVITIES

3.1 Well Installation

From February 26 to March 5, 2020 drilling activities were conducted in support of aquifer testing in the study area. One pumping well (APT-01) and two observation wells (PWOW-01 and PWOW-2) were installed. Drilling, well installation and well development activities were performed by SAEDACCO of Fort Mill, South Carolina, under the oversight of a Geosyntec geologist. Prior to subsurface disturbance, utility locating was performed around the proposed boring locations by The Underground Detective of Atlanta, Georgia, on February 26, 2020, to identify subsurface anomalies that could potentially represent underground utilities. No utilities were detected near the drilling locations. As part of subsurface clearance procedures, each borehole was hand excavated to 5 ft bgs using a post hole digger to further avoid the potential for encountering any buried utilities.

Drilling was performed using a rotasonic drill rig and a combination of 4, 6, 8, and 10-inch diameter drill casing. Soils were logged by a Geosyntec geologist according to the Unified Soil Classification System (USCS). In addition to logging, the soil was screened for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID). The majority of PID readings were below 20 parts per million (ppm). An attempt was made to collect two undisturbed samples of the aquifer material at the pumping well location using Shelby tube sampling methods; however, the sandy aquifer material was not sufficiently cohesive to be retained in the Shelby tube. To provide aquifer property data, aquifer material was collected from APT-01 at three intervals (79 – 80 ft bgs, 84 – 85 ft bgs, and 94 – 95 ft bgs) and from PWOW-02 at two intervals (81-82 ft bgs and 86 – 87 ft bgs), and submitted to TestAmerica Laboratories in Savannah, Georgia ("TestAmerica") under chain-of-custody protocols for grain size analysis in accordance with ASTM D422.

The pumping well, APT-01, borehole was 10-inches in diameter and had a total depth of 97 ft bgs. Based on review of adjacent boring logs, APT-01 was screen in the deep zone of the upper surficial aquifer. APT-01 was screened from 75-95 ft bgs with 6-inch diameter, 0.020-inch wire-wrap stainless steel screen and schedule 40 PVC riser with 2.5 ft of stick up above the ground surface. The sand filter pack consisted of 5/16 mesh sand and extended from 71 to 95 ft bgs, with 4 ft of 0.25-inch time-release bentonite pellets placed on top. The depth to the top of the bentonite seal was checked by the Geosyntec geologist to confirm that bridging did not occur and to monitor expansion of the seal

during hydration. The bentonite seal was allowed to hydrate for 24 hours prior to grouting. The annular space above the seal was grouted from 67 feet to just below ground surface with a high-solids bentonite grout via a tremie pipe.

Following completion of the drawdown test, the well riser was cut down to just below ground surface, and a 3-ft by 3-ft by 4-inch concrete pad with a 12-inch manhole cover was constructed around the well on March 13, 2020. The pad was sloped outward to direct surface drainage away from the manhole cover. A well tag containing the well identification information, date installed, and construction information was installed in the well pad.

Two aquifer pumping test observation wells, PWOW-01 and PWOW-02, were installed at distances from APT-01 of approximately 50 ft and 100 ft, respectively. The observation wells were installed as 2-inch diameter wells in a 6-inch borehole diameter. Both observation wells were drilled to terminal depths of 90 ft bgs, and the wells were constructed with 0.010-inch machine slotted PVC screen set at 80-90 ft bgs, with schedule 40 PVC riser. Each well had 5/16 mesh filter pack sand added to 2 ft above the screen from 78 to 90 ft bgs. Approximately 2.5 ft of 0.25-inch time-release bentonite pellets was added on top of the filter pack sand. Depth to the top of the seal was checked by the Geosyntec geologist to confirm that bridging did not occur and to monitor expansion of the seal during hydration. The bentonite seal was allowed to hydrate for 24 hours prior to grouting. The annular space above the seal was grouted from 75.5 feet to just below ground surface with a high-solids bentonite grout via a tremie pipe. A 3-ft by 3-ft by 4-inch concrete pad with a 12-inch manhole cover was constructed around each well. The pads were sloped outward to direct surface drainage away from the manhole cover. A well containing the well identification information, date installed, and construction information was installed in each well pad.

Well construction information for APT-01, PWOW-01, PWOW-02, and additional observation wells previously installed in the study area in 2016 and 2019 used during the aquifer pumping test are summarized in **Table 1**. Boring and well construction logs for newly installed wells APT-01, PWOW-01, and PWOW-02 are provided in **Appendix B**. The PID soil screening results are included on the logs.

3.2 Well Development

APT-01 was developed using a combination of surge block and air-lift methods using compressed air. An initial development was performed on February 28, 2020, before

installation of the grout seal, to remove drilling mud and to promote hydraulic connection between the well and aquifer. Depth to water at time of initial development was measured at approximately 2 ft bgs. Approximately 35 gallons of water were pumped from the well until the discharge water was free of visible fines. Following installation of the grout seal, additional development was performed on March 2, 2020, and approximately 150 gallons of water were pumped from the well. At the termination of development, the water purged from the well was free of visible fines, and final turbidity was measured at 8.96 Nephelometric Turbidity Units (NTUs).

PWOW-01 and PWOW-02 were developed on March 5, 2020. The wells were surged and purged using a submersible pump until the pumped water was free of visible fines. Depth to water at PWOW-01 and PWOW-02 at the time of development were approximately 2 ft bgs and 2.3 ft bgs, respectively. Approximately 30 gallons were purged from each well. Final turbidity measurements for PWOW-01 and PWOW-02 were 2.92 and 7.32 NTU, respectively.

4. STEP-DRAWDOWN AQUIFER TEST ACTIVITIES

4.1 Step-Drawdown Test Procedures

The step-drawdown test was performed at well APT-01 to (i) estimate the well efficiency of APT-01, (ii) estimate hydraulic properties of the aquifer at APT-1, and (iii) assess the ROI and approximate shape of the drawdown cone during pumping. The step-drawdown test well network consisted of pumping well APT-01, new observation wells PWOW-01, and PWOW-02, a background well (MW-49D), and two existing wells (PSOW-8 and PSOW-10) installed in 2016 as part of a remedial technology pilot test using in situ sorption using nanoscale carbon. The observation wells were chosen to provide groundwater level data at various distances from APT-01: PSOW-10 located at a distance of 6 ft, PSOW-8 located at a distance of 9 ft, PWOW-01 at 50 ft, and PWOW-02 at a distance of 100 ft. Background well MW-49D is located approximately 1,600 ft southwest of APT-01 (**Figure 2**) and was selected to provide background groundwater level data beyond the influence of the step-drawdown test.

Monitoring of water levels in the aforementioned pumping well and observation wells commenced one day prior to the start of step-drawdown test. Pressure transducers (In-Situ Rugged Troll 200 Data Loggers®), set to collect water level information on a linear interval of 5 seconds, were installed in APT-01, observation wells PWOW-01, PWOW-02, PSOW-10, and PSWO-8, and background well MW-49D on March 11, 2020. Manual water levels were collected from each location at the time of transducer installation. A barometric pressure transducer was deployed to measure changes in atmospheric pressure during the test. After completion of the step-drawdown test, water level recovery was monitored with the transducers for 14 hours.

A 3-inch diameter stainless steel Grundfos single-phase submersible groundwater pump was used to extract groundwater in APT-01 during the step-drawdown test. A 2-inch diameter galvanized steel drop pipe was used to connect the pump to the surface wellhead manifold. The wellhead manifold included a pressure gauge, gate valve, and analog flow meter. The gate valve was used to control the flow rate during each step of the aquifer test. The flow meter was placed on flat ground approximately 10 ft downstream of the gate valve. The pump was powered with a 230V power source provided by a 6,000-watt portable gas-powered generator. The pump was capable of providing flow rate ranges expected to be used during the step-drawdown test.

The step-drawdown test began at 1300 on March 12, 2020. During the test, APT-01 was pumped at five flow rates (8, 12, 15, 25, and 35 gallons per minute [gpm]) at durations ranging from 40 minutes and 145 minutes. Discharge rates during each step of the drawdown test were measured using an inline analog flow meter. Water levels were continuously monitored by the pressure transducers installed in APT-01, the four observation wells, and the background well using pressure transducers as noted above. With the exception of the background well, water levels at each instrumented well location, and four additional observation wells located in the vicinity of APT-01 (PSOW-12, PSOW-4, PSOW-2, and PSOW-6) were gauged manually at one-hour intervals during the test and just prior to the end of the test to provide supplemental information on ROI achieved during the aquifer test.

Extracted groundwater was pumped through a 2-inch hose that discharged into a 275-gallon tote located next to the pumping well. Water from the 275-gallon tote was transferred from the totes into a 21,000-gallon frac tank using a 2-inch centrifugal gas-powered trash pump and 2-inch fire hose.

The pumping portion of the test was shutdown at 2100 on March 12, 2020 and the recovery portion of aquifer testing began. After 14 hours of recovery the pump and transducers were recovered on March 13, 2020, and SAEDDACO and Geosyntec demobilized from the Site.

4.2 Groundwater Characterization

Temperature, pH, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and salinity were measured at the APT-01 discharge at one-hour intervals during the aquifer test and measurements were recorded on a groundwater sampling measurement log (**Appendix C**). Three groundwater samples were collected from the 2-inch hose discharge from APT-01 at approximately 2 hours (PT-01), 4 hours (PT-02), and 7 hours (PT-03) from the start of the pumping test for laboratory analysis for groundwater quality characterization. The samples were shipped under chain-of-cusotdy protocol to TestAmerica Laboratories (TestAmerica) in Savannah, Georgia, for laboratory analysis. Samples were analyzed for Site-specific VOCs, pesticides, total metals, anions, hardness, alkalinity, total organic carbon (TOC), dissolved organic carbon (DOC), total dissolved solid (TDS), and total suspended solid (TSS). Analytical results

are presented in **Table 5** and the laboratory analytical report for the groundwater characterization samples is included as **Appendix D**.

4.3 Step-Drawdown Test Analysis

4.3.1 Overview

Transducer data from pumping well APT-01 and the four instrumented observation wells were downloaded and plotted along with manual water level measurements to evaluate transducer accuracy. A graphical summary of the correlation of manual water levels and transducer data for APT-01 and PSOW-10 are shown in **Figure 3** as a demonstration of transducer accuracy. At APT-01, the transducer was moved after the initial water level measurement was collected and prior to the start of the pumping test, resulting in the approximate one-foot discrepancy as shown in the graph. The discrepancy does not affect the results or the interpretation of the step-drawdown test data as data evaluation is based on the change in water levels relative to static during the drawdown portion of the test, and recovery to static at termination of pumping; as shown in **Figure 3**, the change in groundwater level from static to the first step and between each subsequent step measured by the transducer is consistent with that measured manually. Manual readings from the other observation wells were also in good agreement with the transducer readings. Transducer data from APT-01 and the four observation wells were corrected for tidal (rhythmic) fluctuation using a tidal cycle recorded during background monitoring at APT-01 and the four observation wells prior to initiation of the step-drawdown test. A reference level was selected at the beginning of the tidal cycle, then the transducer data was corrected with respect to the reference level by subtracting and adding during high tide and low tide, respectively (Kruseman and de Ridder, 1994).

APT-01 was pumped at five distinct steps (8, 12, 15, 25, and 35 gpm), as shown in **Figure 4,** at durations ranging from 40 minutes and 145 minutes. Drawdown over the period of each step is shown below:

- Step 1 at 8 gpm: 0.41 ft over 40 minutes;
- Step 2 at 12 gpm: 0.28 ft (cumulative drawdown of 0.69 ft) over 100 minutes;
- Step 3 at 15 gpm: 0.50 ft (cumulative drawdown of 1.19 ft) over 120 minutes;
- Step 4 at 25 gpm: 1.08 ft (cumulative drawdown of 2.27 ft) over 145 minutes; and
- Step 5 at 35 gpm: 0.71 ft (cumulative drawdown of 2.98 ft) over 70 minutes.

Total drawdown from static conditions observed at APT-01 over the duration of the 475-minute step-drawdown test was 2.98 feet. Total drawdown observed at PSOW-8, PSOW-10, PWOW-1, and PWOW-2 over the duration of the 475-minute step-drawdown test was 0.82 feet, 0.78 feet, 0.59 feet, and 0.57 feet, respectively. Drawdown measured at each step and total drawdown observed at APT-01 and the four observation wells are summarized in **Table 2**.

4.3.2 Aquifer Loss, Well Loss Coefficient, and Well Efficiency

The step-drawdown test results can be used to evaluate the performance of APT-01 under the various discharge rates. Specifically, the formation or aquifer losses, well losses, and well efficiency can be assessed using the step-drawdown data. Jacob (1947) proposed the following drawdown equation to determine aquifer loss and well loss as a function of discharge rate (Jacob, 1946):

$$S_w = BQ + CQ^2$$

Where:
S_w = Total drawdown measured in the well (ft)
B = Formation or aquifer loss coefficient (ft/gpm)
Q = Discharge rate of the well (gpm)
C = Well loss coefficient (ft/gpm^2)

The total drawdown in a pumping well consists of two components, aquifer loss coefficient (B) and well loss coefficient (C), which can be determined from the step-drawdown test data. Aquifer loss is the component of drawdown that occurs in the aquifer where the flow is laminar, is time-dependent, and varies linearly with the well discharge (i.e., BQ). Well loss is the component of total drawdown resulting from turbulent flow in the vicinity of the well caused by the effects of drilling and well construction (non-linear well loss), and can be described as proportional to the square of the discharge rate (i.e., CQ^2). By plotting the specific drawdown (S_w/Q) against the discharge rate (Q) for each step, the aquifer loss coefficient (B) is obtained as the y-intercept, and the well loss coefficient (C) is obtained as the slope of the best fit straight line (**Figure 5**; Bierschenk, 1964).

Well efficiency is the ratio of the theoretical drawdown assuming no turbulence (i.e., CQ^2 is not considered, retaining only aquifer loss component BQ) to the actual drawdown measured in the well (S_w). Well efficiency is often expressed as a percent (%). Well efficiency (E_w) is defined by the following equation (Roscoe Moss, 1990):

$$E_w = 100\ (BQ/S_W) = 100/\ (1 + CQ/B)$$

Where:
E_w = Well Efficiency (%)
S_w = Total drawdown measured in the well (ft)
B = Formation or aquifer loss coefficient (ft/gpm)
Q = Discharge rate of the well (gpm)
C = Well loss coefficient (ft/gpm^2)

An efficiency of 70 to 80% is usually obtainable if good design, construction, and development practices are followed (Driscoll, 1986). Well efficiency calculations for APT-01 are shown in **Table 3.** As pumping rates increase, turbulent flow around and within the pumping well will increase, resulting in a decrease in well efficiency (Driscoll, 1986). This decrease in efficiency as pumping rates increase was observed during the APT-01 step-drawdown test, as well efficiency decreased from 93.5% during Step 1 (8 gpm) to 56.1% during Step 5 (35 pgm). Overall, the high well efficiencies calculated indicate good design, construction, and development of APT-01.

4.3.3 Aquifer Properties

Hydraulic properties, including horizontal hydraulic conductivity (K_h), transmissivity (T), and storativity (S), were estimated from the APT-01 step drawdown test using both the drawdown and recovery data. Based on the APT-01 boring log showing semi-confining sandy lean clay and lean clay units (**Appendix B**) and the near-instantaneous drawdown response from the four observation wells, the aquifer in the interval screened at APT-01 (75 – 95 ft bgs) is considered to behave as a confined to semi-confined aquifer. Analytical solutions used for the confined to semi-confined aquifer scenario include the following:

- Theis (1935) - Confined Aquifer;
- Dougherty-Babu (1984) - Confined Aquifer; and
- Hantush-Jacob (1955) - Leaky Aquifer.

Transducer datalogger output files were downloaded, exported directly into a spreadsheet and converted to an appropriate input file format for analysis using AQTESOLV (HydroSOLVE, Inc.; Duffield, 2007) to estimate aquifer properties through curve matching, using the analytical methods listed above. Both drawdown and recovery data were used for curve matching. The geometric mean was then used to summarize the hydraulic property values calculated with each analytical method. **Table 4** summarizes

the inputs and results of the step-drawdown test analysis using curve matching techniques and distance-drawdown results from the last step (35 gpm) of the step-drawdown test. Individual AQTESOLV output plots are included in **Appendix E and F**.

K_h values were calculated by dividing the transmissivity (T) output from AQTESOLV by an aquifer thickness (b) of 65 ft, which corresponds to the saturated poorly graded sand thickness observed at APT-01. Based on curve match techniques for the step-drawdown test and assuming aquifer anisotropy of 0.1, the estimated K_h of the aquifer at APT-01 ranged from 3.41×10^{-2} cm/sec to 3.89×10^{-2} cm/sec, with a geometric mean of 3.70×10^{-2} cm/sec (105 ft/day). Estimated storativity (S) of the aquifer at APT-01 ranged from 1.01×10^{-2} to 1.82×10^{-2}, with a geometric mean of 1.48×10^{-2}, which is within the range of representative values for loose sand. Aquifer anisotropy sensitivity was evaluated by increasing the anisotropy ratio (K_v/K_h) from 0.1 to 1.0. Estimated K_h ranges only decreased to 3.02×10^{-2} cm/sec to 3.35×10^{-2} cm/sec, with a geometric mean of 3.19×10^{-2} cm/sec (90 ft/day).

Based on the distance-drawdown results and assuming aquifer anisotropy of 0.1, the estimated K_h of the aquifer at APT-01 ranged from 5.63×10^{-2} cm/sec to 5.93×10^{-2} cm/sec, with a geometric mean of 5.82×10^{-2} cm/sec (165 ft/day). Estimated storativity (S) of the aquifer at APT-01 ranged from 1.01×10^{-2} to 1.24×10^{-2}, with a geometric mean of 1.14×10^{-2}, which is within the range of representative values for loose sand. Aquifer anisotropy sensitivity was evaluated by increasing the anisotropy ratio (K_v/K_h) from 0.1 to 1.0. Estimated K_h ranges only decreased to 3.91×10^{-2} cm/sec to 3.92×10^{-2} cm/sec, with a geometric mean of 3.92×10^{-2} cm/sec (111 ft/day).

4.3.4 Radius of Influence

At a pumping rate of 35 gpm, the ROI from APT-01 extended as far as 100 feet, as indicated by 0.57 ft drawdown measured at PWOW-2 (**Figure 6**). As shown on **Figure 6**, the ROI is generally oblong, slightly elongated in a northwest-southeast orientation. Distance-drawdown data from the last step (35 gpm) of the step-drawdown test were used to calculate the theoretical radius of influence from APT-01. Based on a pumping rate of 35 gpm, the lateral distance form APT-01 where no drawdown is expected ranges from approximately 500 - 600 ft. Individual AQTESOLV output plots are included in **Appendix F**.

3.4 Aquifer Material Properties

Soil samples were collected from three depth intervals at APT-01 (79-80 ft bgs, 84-85 ft bgs, and 94-95 ft bgs) and two depth intervals at PWOW-02 (81-8 ft bgs and 86-87 ft bgs) during drilling of the well boreholes. The samples were submitted to Test America for analyses for grain size to provide an understanding of the grain size distribution of the sandy aquifer material in the study area. The material was almost exclusively sand (85-90%) with trace fines, and the dominant grain size (65%) was held on 20 to 40 mesh sieves, indicating a medium sand. The USCS classification of the material is medium sand with trace silt. The aquifer parameters used in the analysis of the pumping test data are within the range presented in published literature (Bouwer, 1978) for medium sand. Furthermore, the estimated K_h, S, and T derived from the analysis presented in Section 4.3.3 is also within the range expected for medium sand. The laboratory results for the grain size analysis are included in **Appendix G**.

5. MANAGEMENT OF INVESTIGATION DERIVED WASTE (IDW)

IDW generated during the monitoring well installation activities consisted of solids (i.e., soil cuttings), liquids (i.e., drilling fluids, decontamination liquids, and well development water), and general solid waste including disposable sampling equipment and personal protective equipment ("PPE") such as nitrile gloves. General solid waste and PPE was placed in garbage bags and disposed of as general trash.

5.1 Soil IDW

Soil cuttings were containerized in a dewatering roll off box staged adjacent to the drilling locations. Liquid accumulated in the dewatering box that separated from the drill cuttings was pumped from the dewatering box into a 21,000-gallon frac tank staged adjacent to the drilling locations. The roll off box was labeled as "IDW – soil" with the dates of IDW generation and drilling locations. Two soil samples, one representing soil having PID readings above 20 ppm and one representing soil with PID readings below 20 ppm, were collected for waste characterization analysis. The samples were shipped under chain-of-custody protocol to TestAmerica in Savannah, Georgia. The samples were analyzed using the Toxicity Characteristic Leaching Procedure ("TCLP") for VOCs and pesticides. VOCs and pesticides were not detected above the applicable laboratory reporting limits ("RLs"). The solid IDW from the field activities was therefore determined to qualify as non-hazardous waste. The dewatering roll off box containing soil IDW generated during the well installation activities was removed from the Site by Clean Harbors under the oversight of Geosyntec Antea on June 9, 2020. The soil IDW waste characterization laboratory report is provided in **Appendix G**.

5.2 Liquid IDW

Liquid IDW were containerized in a 21,000-gallon frac tank staged adjacent to the drilling locations. The liquid IDW included equipment decontamination fluid, liquid accumulated in the dewatering soil roll off which had separated from the drill cuttings and was pumped into the frac tank, well development purged groundwater, and groundwater extracted during the step-drawdown test. The frac tank was appropriately labeled as "IDW – liquid" and the dates of IDW generation and generation activities were noted on the label.

For waste characterization of the liquid IDW, one composite grab sample was collected from the frac tank on March 12, 2020, at the end of the aquifer step-drawdown test and

shipped under chain-of-custody protocol to TestAmerica in Savannah, Georgia. The sample was analyzed using TCLP for waste characterization for VOCs and pesticides. No VOCs or pesticides were detected above the applicable laboratory RLs in sample 01-PT-03122020 with the exception of benzene and chlorobenzene. The detection of benzene (0.29 mg/L) did not exceed the applicable toxicity characteristic limit of 0.5 mg/L. The detection of chlorobenzene (0.23 mg/L) did not exceed the applicable toxicity characteristic limit of 100 mg/L. As such, the liquid IDW was determined to be non-hazardous waste liquid. All liquid IDW generated during monitoring well installation activities and aquifer step-drawdown test activities was removed from the Site by Clean Harbors during the week of June 8, 2020. The liquid IDW waste characterization laboratory report is provided in **Appendix D**.

6. CONCLUSIONS

A pumping well and two observation wells were installed in the eastern portion of the Site for use in aquifer testing activities. The step-drawdown test was completed to obtain hydrogeological and groundwater quality information from the deep zone of the upper surficial aquifer. The test included baseline (background) water level monitoring, a step-drawdown test, and a recovery test. The deep zone of the surficial aquifer is semi-confined to confined in the portion of the Site where the test was conducted, and primarily consists of medium grained sand.

Well efficiency at pumping well APT-01 under the various discharge rates used during the step-drawdown test ranged from greater than 80% at rates less than 15 gpm to 56% at 35 gpm. Three analytical solutions were used to estimate the hydraulic properties of the deep zone of the upper surficial aquifer material and the geometric mean of the step-drawdown test results indicate a horizontal hydraulic conductivity of approximately 3.70×10^{-2} cm/sec (105 ft/day). Geometric mean of distance-drawdown results from the last step (35 gpm) of the step-drawdown test indicate a horizontal hydraulic conductivity of approximately 5.82×10^{-2} cm/sec (165 ft/day). Results of the distance-drawdown analyses, based on a maximum pumping rate of 35 gpm, estimates the ROI to be approximately 600 feet from pumping well APT-01.

7. REFERENCES

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TABLES

Table 1
Well Construction Summary - Aquifer Test Area Wells
Hercules/Pinova Facility
Brunswick, Georgia

Well ID	Installation Date	Northing	Easting	Total Depth Below Ground Surface (ft bgs)	Screened Interval Depth Below Ground Surface (ft bgs)	Top of Casing Elevation (ft msl)	Well Purpose for Aquifer Test
APT-01	3/2/2020	425185.29	872100.41	97.0	75-95	6.50	Pumping Well
PWOW-01	3/5/2020	425139.32	872120.32	90.0	80-90	5.96	Observation Well
PWOW-02	3/5/2020	425107.94	872158.61	90.0	80-90	6.22	Observation Well
PSOW-8	6/13/2016	425176.69	872101.34	89.5	84.5-89.5	6.68	Observation Well
PSOW-10	6/13/2016	425189.91	872104.55	90.0	85-90	6.58	Observation Well
PSOW-2	6/13/2016	425107.94	872158.61	90.0	85-90	6.22	Observation Well
PSOW-4	6/13/2016	425181.50	872091.09	89.0	84-89	6.61	Observation Well
PSOW-6	6/13/2016	425168.44	872097.87	89.8	84.8-89.8	6.76	Observation Well
PSOW-12	6/13/2016	425177.84	872110.41	89.0	84-89	6.62	Observation Well
MW-49D	6/10/2019	424232.10	870735.10	103.0	86-96	9.79	Background Observation Well

Notes:

Wells installed in June 2016 and 2019, well coordinates and elevations were surveyed on October 1, 2015 and are referenced to NAD 1983 and NAVD 1988 datum.

Wells installed in March 2020, well coordinates and elevations were surveyed on March 27, 2020 and are referenced to NAD 1983 and NAVD 1988 datum.
All wells are screened in the deep zone of the upper surficial aquifer

ft = feet

ft bgs = feet below ground surface

ft msl = ft above mean sea level

Table 2
Observed Drawdown at APT-01 and Observation Wells
Hercules/Pinova Facility
Brunswick, Georgia

	APT-01	PSOW-10	PSOW-8	PWOW-1	PWOW-2	PSOW-4 (1)	PSOW-12 (1)	PSOW-6 (1)	PSOW-2 (1)
Distance from APT-01 (ft)	---	**6**	**9**	**50**	**100**	**12**	**15**	**17**	**32**
Maximum Drawdown Observed at End of Each Step (ft)									
Step 1	0.41	0.14	0.15	0.06	0.11	NM	NM	NM	NM
Step 2	0.28	0.12	0.13	0.10	0.07	NM	NM	NM	NM
Step 3	0.50	0.13	0.14	0.13	0.10	NM	NM	NM	NM
Step 4	1.08	0.27	0.25	0.20	0.17	NM	NM	NM	NM
Step 5	0.71	0.12	0.16	0.11	0.12	NM	NM	NM	NM
Total Drawdown at End of Step-Drawdown Test (ft)	**2.98**	**0.78**	**0.82**	**0.59**	**0.57**	**0.85**	**0.80**	**0.84**	**0.78**

(1) Depth to groundwater measurements were collected at PSOW-2, PSOW-4, PSOW-6, and PSW-12 prior to initiation of the step drawdown test and prior to termination of the test. These locations were not monitored during the test activities.
ft = feet

Table 3
APT-01 Well Efficiency Calculations
Hercules/Pinova Facility
Brunswick, Georgia

Step	Q (gpm)	Max s (ft)	s per step (ft)	Q/s (gpm/ft)	s/Q (ft/gpm)
1	8	0.408	0.408	19.608	0.051
2	12	0.686	0.278	17.493	0.057
3	15	1.185	0.499	12.658	0.079
4	25	2.265	1.080	11.038	0.091
5	35	2.975	0.710	11.765	0.085

B* (ft/gpm)	C** (ft/gpm^2)	BQ	CQ^2	Well Efficiency ((B*Q/s)*100) (%)
0.0477	0.0013	0.382	0.083	93.5
		0.572	0.187	83.4
		0.716	0.293	60.4
		1.193	0.813	52.6
		1.670	1.593	56.1
		Mean		69.2

Notes:

Max s = Maximum drawdown measured in the well (ft)
Q = Discharge rate of the well (gpm)
B = Formation or aquifer loss coefficient (ft/gpm)
C = Well loss coefficient (ft/gpm^2)
s = Drawdown measured in the well (ft)
* = y-intercept of the best fit straight line
** = Slope of the best fit straight line
ft = feet
gpm = gallons per minute

Table 4
Summary of AQTESOLV Input Parameters and Test Analysis Results
Hercules/Pinova Facility
Brunswick, Georgia

			APT-1	
Well Information	Well Diameter (in.)		6	6
	Initial Boring Diameter (in.)		10	10
	Screen interval (ft BGS)		75 to 95	75 to 95
	Well Depth (ft BGS)		95	95
	Confined or Unconfined Aquifer		Confined/Semiconfined	Confined/Semiconfined
AQTESOLV Input	Aquifer Thickness (ft)		65	65
	Pumping Rates (gpm)		8/12/15/25/35	8/12/15/25/35
	Aquifer Saturated Thickness (ft) [AQTESOLV "b"]		65	65
	Hydraulic Conductivity Anisotropy Ratio [AQTESOLV "Kv/Kh"]		0.1	1.0
	Well Configuration		Partial Penetration	Partial Penetration
	Length from Confining Unit Bottom to Top of Screen [AQTESOLV "d"]		45	45
	Screen Length (ft) [AQTESOLV "L"]		20	20
	Inside Radius of Well Casing (ft) [AQTESOLV "r(c)"]		0.25	0.25
	Radius of Well (ft) [AQTESOLV "r(w)"]		0.25	0.25
	Radius of Downhole Equipment (ft) [AQTESOLV "r(eq)"]		0.083	0.083
Step-drawdown Test Results	Theis (1935) Confined Aquifer	K (ft/day)	108.61	91.38
		T (ft^2/day)	7059	5940
		K (cm/sec)	0.0383	0.0322
		T (cm^2/sec)	75.91	63.87
		S	0.0177	0.0177
	Dougherty-Babu (1984) Confined Aquifer	K (ft/day)	110.19	95.01
		T (ft^2/day)	7162	6176
		K (cm/sec)	0.0389	0.0335
		T (cm^2/sec)	77.02	66.41
		S	0.0101	0.0101
	Hantush-Jacob (1955) Leaky Aquifer	K (ft/day)	96.75	85.57
		T (ft^2/day)	6289	5562
		K (cm/sec)	0.0341	0.0302
		T (cm^2/sec)	67.62	59.80
		S	0.0182	0.0182
	Geometric Mean	K (ft/day)	105.01	90.57
		T (ft^2/day)	6825.42	5886.99
		K (cm/sec)	0.0370	0.0319
		T (cm^2/sec)	73.39	63.30
		S	0.0148	0.0148
Distance-drawdown Test Results	Theis (1935) Confined Aquifer	K (ft/day)	167.08	110.88
		T (ft^2/day)	10860	7207
		K (cm/sec)	0.0589	0.0391
		T (cm^2/sec)	116.77	77.50
		S	0.0124	0.0013
	Dougherty-Babu (1984) Confined Aquifer	K (ft/day)	159.69	110.89
		T (ft^2/day)	10380	7208
		K (cm/sec)	0.0563	0.0391
		T (cm^2/sec)	111.61	77.51
		S	0.0101	0.0040
	Hantush-Jacob (1955) Leaky Aquifer	K (ft/day)	168.15	111.23
		T (ft^2/day)	10930	7230
		K (cm/sec)	0.0593	0.0392
		T (cm^2/sec)	117.53	77.74
		S	0.0119	0.0013
	Geometric Mean	K (ft/day)	164.93	111.00
		T (ft^2/day)	10720.52	7215.06
		K (cm/sec)	0.0582	0.0392
		T (cm^2/sec)	115.27	77.58
		S	0.0114	0.0019

Notes:
in. = inches
ft = feet
cm = centimeter
sec = second
ft BGS = feet below ground suface
ft/day = feet per day
ft^2/day = square feet per day
cm/sec = centimters per second
cm^2/sec = square centimeters per second
gpm = gallons per minute
S = storativity
T = transmissivity
K = hydraulic conductivity
Kv/Kh = vertical to horizontal hydraulic conductivity anisotropy ratio
AQTESOLV = AQuifer TEst SOLVer

Table 5
APT-01 Aquifer Test Groundwater Sample Results
Hercules/Pinova Facility
Brunswick, Georgia

	PT-01	PT-02	PT-03
Sample Date	**3/12/2020**	**3/12/2020**	**3/12/2020**
Sample Time	**15:00**	**17:00**	**20:20**
Time Since Start of Aquifer Test	**2 hours**	**4 hours**	**7 hours**
Volatile Organics (µg/L)			
Acetone	10 U	10 U	10 U
Benzene	**220 H**	**320 H**	**290 H**
Carbon disulfide	2 U	2 U	2 U
Chlorobenzene	**210 H**	**250 H**	**200 H**
Chloroform	1 U	1 U	1 U
cis-1,2-Dichloroethene	**2.2**	**2.8**	**3.0**
1,2-Dichlorobenzene	**2.9**	**2.7**	**2.0**
1,4-Dichlorobenzene	**4.0**	**4.0**	**2.9**
1,1-Dichloroethane	1 U	1 U	1 U
1,1-Dichloroethene (1,1-Dichloroethylene)	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U
Ethyl Benzene	**5.6**	**6.6**	**5.7**
Methylene Chloride	5 U	5 U	5 U
Methyl Ethyl Ketone (MEK)	10 U	10 U	10 U
Methyl Isobutyl Ketone (MIBK)	10 U	10 U	10 U
p-Isopropyltoluene (p-Cymene)	1 U	1 U	1 U
Tetrachloroethene (Tetrachloroethylene)	1 U *	1 U *	1 U *
Toluene	**1.8**	**2.1**	**2.2**
1,2,4-Trichlorobenzene	5 U	5 U	5 U
Total Xylenes	**25**	**97**	**150**
Vinyl chloride	**3.0**	**3.7**	**3.2**
Organochlorinde Pesticides and Polychlorinated Biphenyls (PBCs) (µg/L)			
alpha-BHC	0.049 U	0.048 U	0.05 U
delta-BHC	0.049 U	0.048 U	0.05 U
gamma-BHC (Lindane)	0.049 U	0.048 U	0.05 U
Toxaphene	4.9 U	4.8 U	5 U
Toxaphene, TAUC	4.9 U	4.8 U	5 U
Metals (µg/L)			
Aluminum	100 U	100 U	100 U
Arsenic	3 U	3 U	3 U
Chromium	5 U	5 U	5 U
Copper	5 U	5 U	5 U
Iron	**6,200**	**11,000**	**12,000**
Manganese	**940**	**960**	**990**
Zinc	**1,200**	**540**	**450**
Anions (mg/L)			
Bromide	**1.2**	**1.1**	0.50 U
Nitrate as N	0.05 U	0.05 U	0.05 U
Nitrite as N	0.05 U	0.05 U	0.05 U
Fluoride	**0.14**	**0.13**	**0.14**
Sulfate	**5.8**	**4.7**	**3.8**
Chloride	**4,100**	**4,000**	**4,100**
Total Hardness (as $CaCO_3$) by Calculation (mg/L)			
Hardness as calcium carbonate	**5,400**	**43,000**	**5,400**
Calcium hardness as calcium carbonate	**5,000**	**42,000**	**5,000**
Magnesium hardness as calcium carbonate	**380**	**370**	**360**
General Chemistry (mg/L)			
Alkalinity	**300**	**310**	**330**
Bicarbonate Alkalinity as CaCO3	**300**	**310**	**330**
Carbonate Alkalinity as $CaCO_3$	5 U	5 U	5 U
Hydroxide Alkalinity	5 U	5 U	5 U
Carbon Dixoide, Free	**53**	**58**	**66**
Phenolphthalein Alkalinity	5 U	5 U	5 U
Bicarbonate ion as HCO_3	**360**	**380**	**400**
Total Organic Carbon	**19**	**20**	**19**
Dissolved Organic Carbon	**17**	**18**	**18**
Total Dissolved Solids	**8,400**	**8,400**	**8,400**
Total Suspended Solids	**72**	**96**	**54**

Notes:
Groundwater samples were collected from the APT-01 discharge point at approximately 2 hours (PT-01), 4 hours (PT-02), and 7 hours (PT-03) after start of the aquifer test.
µg/L = micrograms per liter
mg/L = milligrams per liter
U - Analyte not detected at laboratory reporting limit.
H - Reanalysis performed outside of the specified analytical holding time due to dilution. Undiluted and diluted (H flagged) results are available in the laboratory report.
* - LCS or LCSD is outside acceptance limits.
Bold - Analyte Detected

Table 6
Grain Size Analysis Results
Hercules/Pinova Facility
Brunswick, Georgia

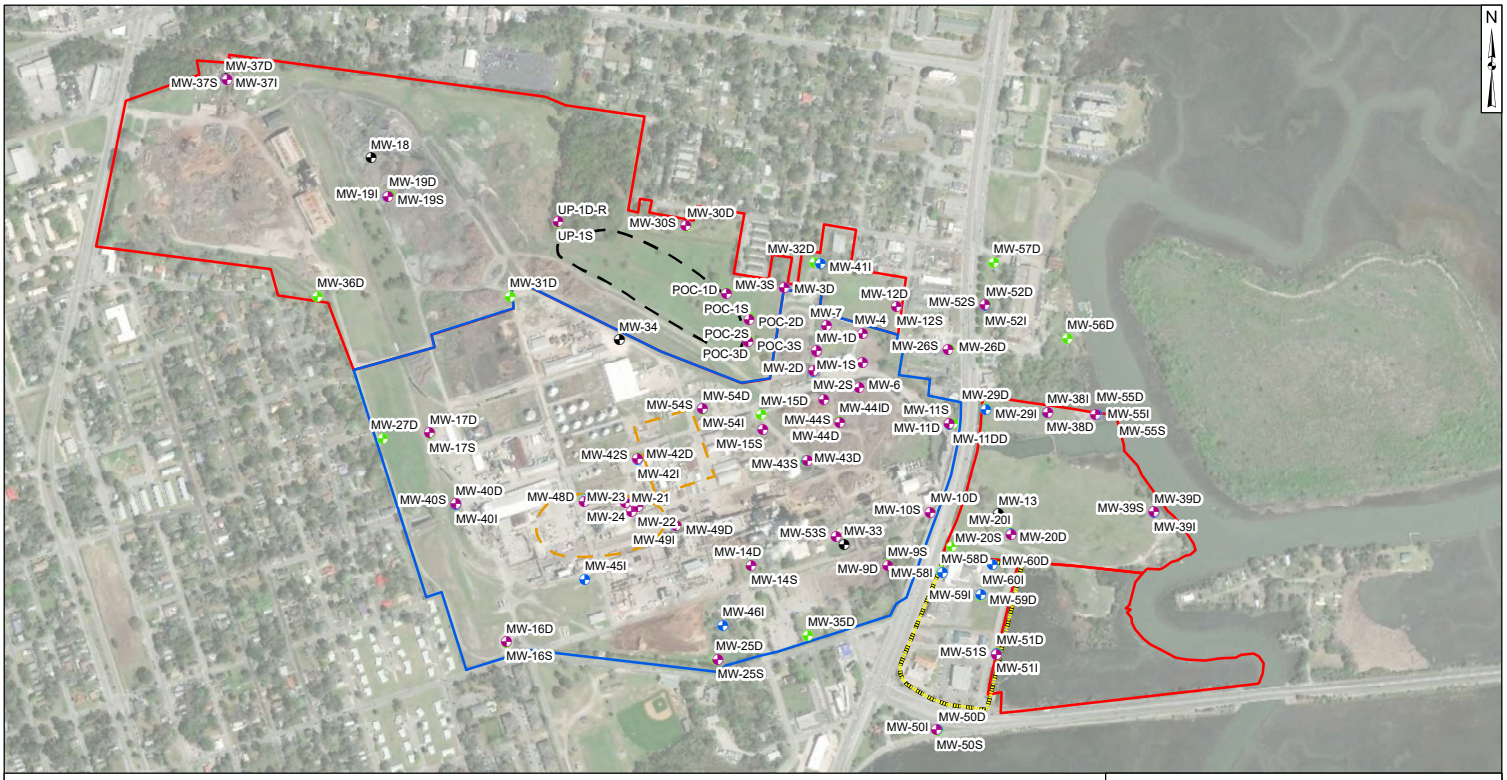
Sample Location	APT-01	APT-01	APT-01	PWOW-02	PWOW-02
Sample Interval (ft BGS)	79-80	84-85	94-95	81	86
Sample Date	2/27/2020	2/27/2020	2/27/2020	3/3/2020	3/3/2020
Sample Time	11:30	11:30	11:30	13:00	13:00
Grain Size Analysis (%)					
Fines	8.3	12.9	10.6	9.7	8.7
Sand [(1)]	90.5	85.6	88.5	89.2	89.4
Fine Sand	17.4	13.4	13.2	9.2	15.8
Medium Sand	62.3	64.3	67.6	71.8	66.0
Coarse Sand	10.6	7.9	7.7	8.2	7.6
Gravel	1.2	1.5	0.9	1.1	2.0

Notes:

(1) Total sand component is further subdivided into fine, medium, and coarse grain size components.

Grain size analysis performed by ASTM Method D422 sieve analysis

FIGURES



Surficial Aquifer, Shallow Zone of Upper Unit Wells
Surficial Aquifer, Intermediate Zone of Upper Unit Wells
Surficial Aquifer, Deep Zone of Upper Unit Wells
Surficial Aquifer, Lower Unit Wells
Approximate Location of Closed Surface Impoundments
Approximate Extent of Identified Source Areas
Southern Offsite Area
Pinova Property
Hercules Property

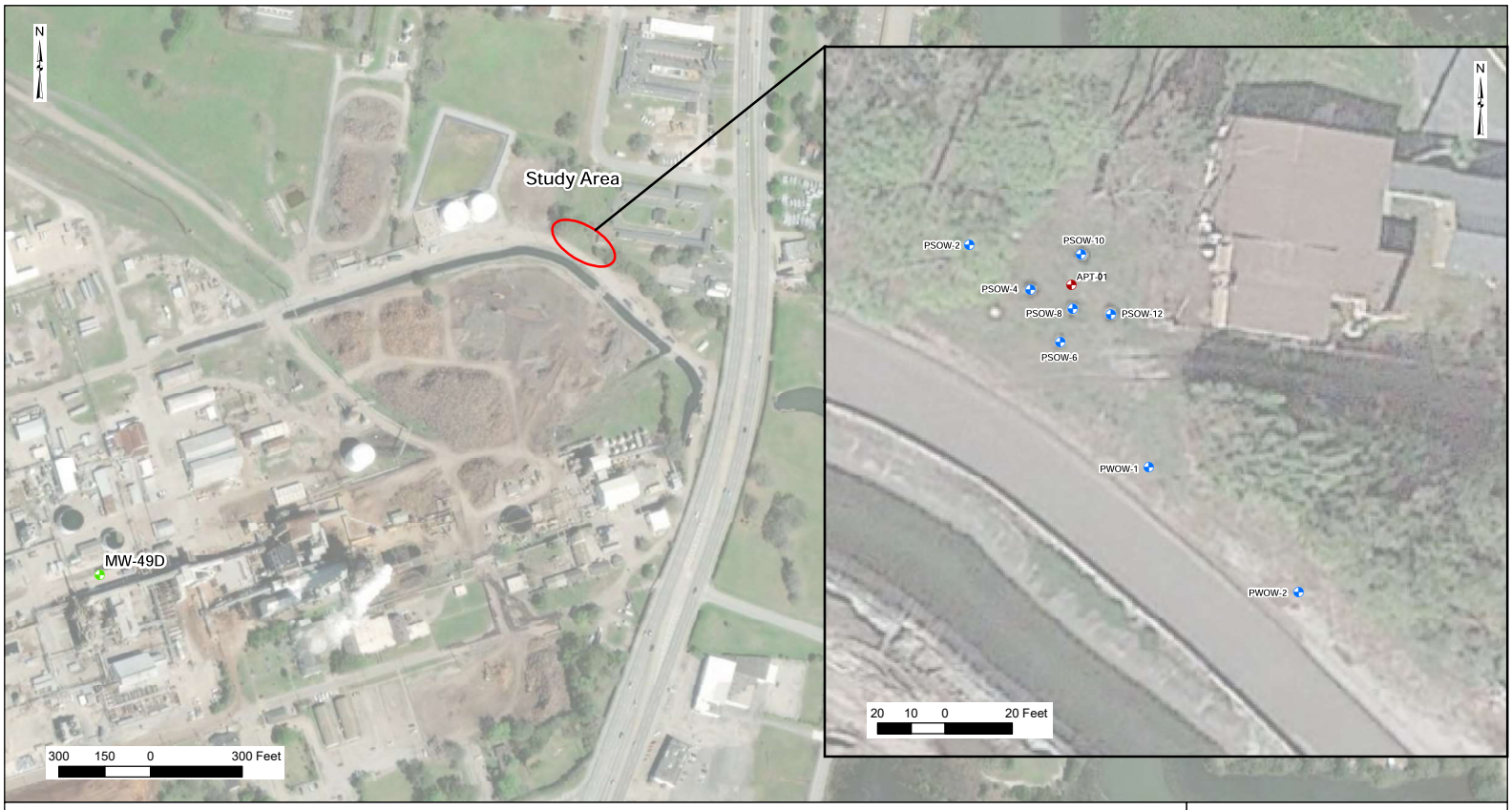
0 250 500 1,000 1,500 Feet

Site Map and Groundwater Monitoring Wells
Hercules/Pinova Facility
Brunswick, Georgia

Geosyntec consultants
Kennesaw, GA | May 2020

Figure 1

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, GIS User Community



Legend

- Pumping Well
- Observation Well
- Background Well

APT-01 Step-Drawdown Test Study Area

Hercules/Pinova Facility
Brunswick, Georgia

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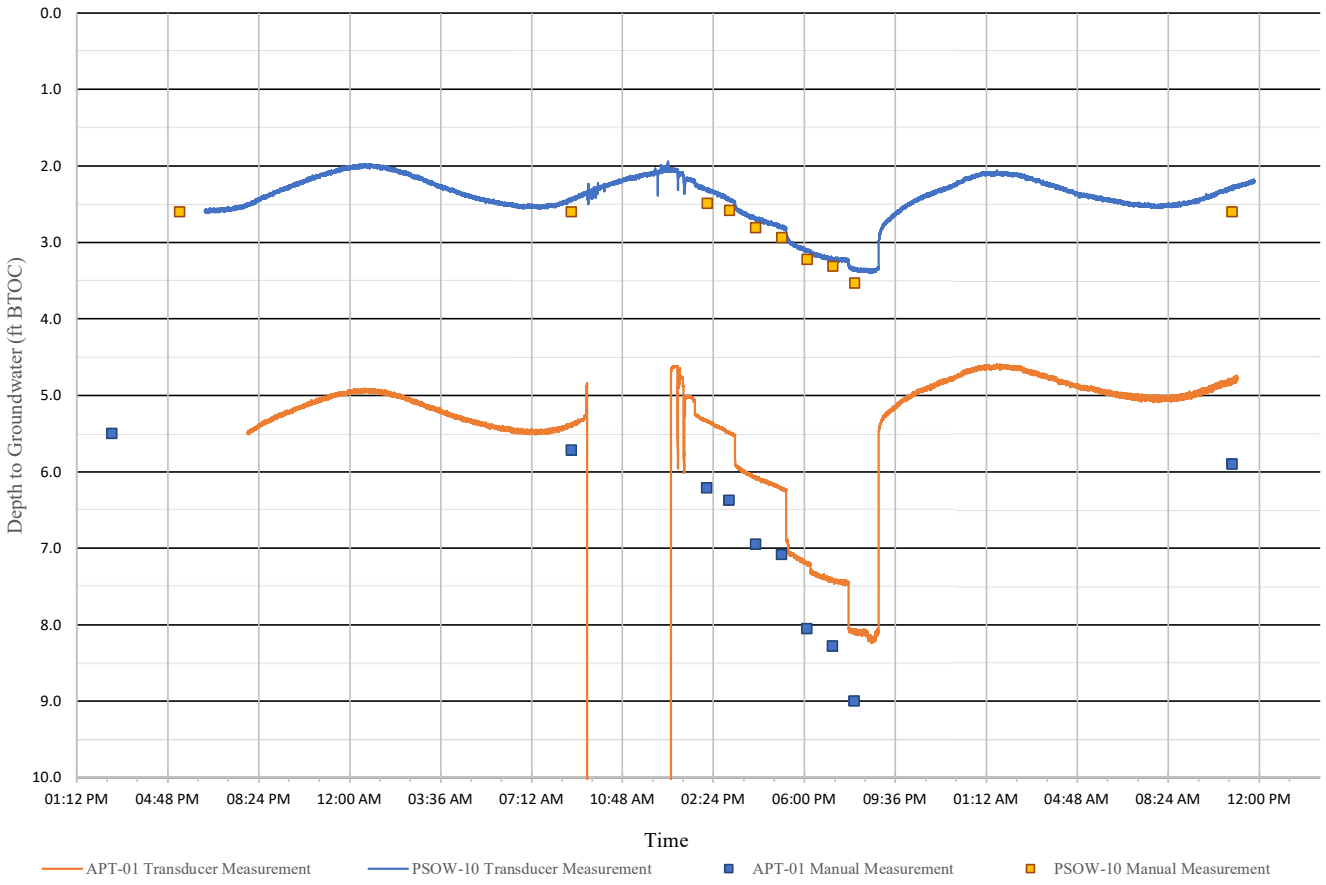
Figure 2



Notes:

ft BTOC – feet below top of casing

The approximately 1-foot discrepancy between transducer and manual readings following the start of the step-drawdown test are due to repositioning of the transducer following re-installation of pumping equipment just prior to the start of the test. Step-drawdown test analyses require only evaluation of the drawdown from static conditions; therefore, the difference between the manual and transducers measurements do not affect data analysis as the overall drawdown observed at each data point is the same for both manual and instrument measurements.

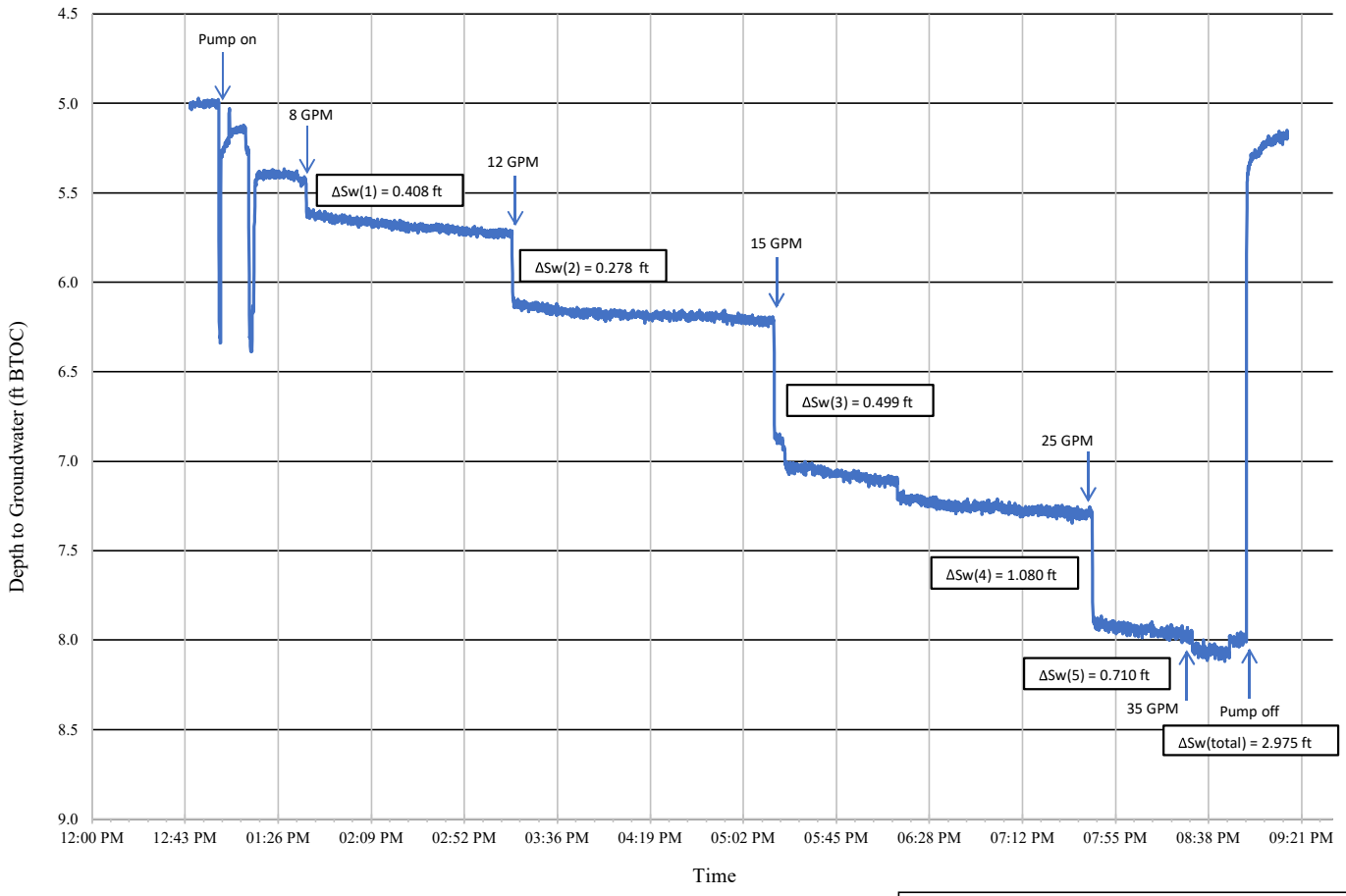
APT-01 Step-Drawdown Test Summary of Transducer and Manual Groundwater Measurements

Hercules/Pinova Facility
Brunswick, Georgia

Geosyntec consultants

Kennesaw, GA | May 2020

Figure **3**



Notes:

Δ S(w) – Groundwater level drawdown (S) at APT-01 at Step 1, 2, 3, 4, 5, and total drawdown at test termination

ft BTOC – feet below top of casing

GPM – gallons per minute

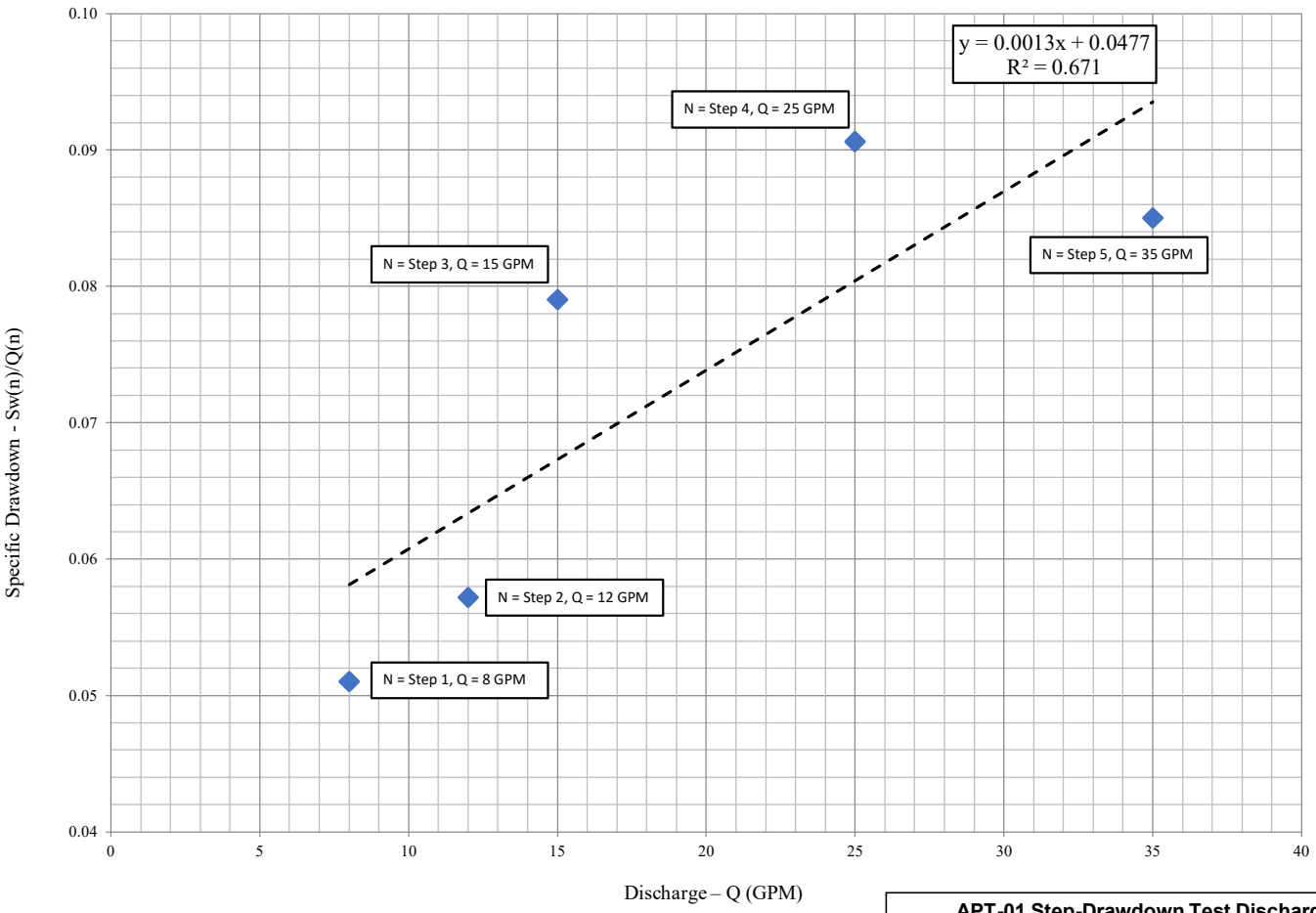
APT-01 Step-Drawdown Test Data

Hercules/Pinova Facility
Brunswick, Georgia

Geosyntec consultants

Kennesaw, GA | May 2020

Figure 4



Notes:
S – Groundwater level drawdown measured at APT-01 at n = step and Q = discharge rate

Q – Discharge rate

GPM – gallons per minute

APT-01 Step-Drawdown Test Discharge vs. Specific Drawdown

Hercules/Pinova Facility
Brunswick, Georgia

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Figure **5**

Legend

- Pumping Well (drawdown in feet)
- Observation Well (drawdown in feet)
- Drawdown Iso-Contour (dashed where inferred)

N

20 10 0 20 Feet

Note:
* - Manual drawdown measurement, taken one hour before the end of the 8-hour Step-Drawdown Test.

APT-01 Step-Drawdown Test Radius of Influence

Hercules/Pinova Facility
Brunswick, Georgia

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Figure 6

APPENDIX A

General Pumping Test Procedures (Geosyntec SOG 160)

Geosyntec consultants

STANDARD OPERATING GUIDELINE NO. 160

GENERAL PUMPING TEST PROCEDURES

Prepared by:_____/s/_____Date: 2/9/2007

Reviewed by:_____/s/_____Date: 2/12/2007

Approved by:_____/s/_____Date: 2/13/2007

SOG No. 160

TABLE OF CONTENTS

STANDARD OPERATING GUIDELINE NO. 160

GENERAL PUMPING TEST PROCEDURES

1. INTRODUCTION

1.1 Overview

This Standard Operating Guideline (SOG) was prepared to direct field personnel in the methods and general procedures for conducting pumping tests in monitoring wells. Additional guidance can be found in Standard Operating Procedures for Aquifer Pumping Tests (Paul Osborne, 1993, EPA/540/S-93-503). A step drawdown test field form is provided with this SOG.

This SOG will be implemented in accordance with the following governing documents:

- Work Plan (where applicable), which provides an overview of the site background and conceptual model and describes the overall investigative goals and scope of work;
- Health and Safety Plan (HASP), which identifies all physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards;
- Field Sampling Plan (FSP) (where applicable), which provides details for field sampling locations and procedures and which will be most frequently used by field staff on-site; and
- Quality Assurance Project Plan (QAPP) (where applicable), which is written to establish protocols necessary to ensure that the data generated are of a quality sufficient to ensure that valid conclusions are drawn from the site characterization.

1.2 Objective

The objectives of pumping tests include identifying aquifer properties of recharge, drawdown, storativity, transmissivity, specific and sustained yield, and aquifer boundaries. Knowledge of these aspects is essential to aid in the understanding of aquifer characteristics for the configuration of remediation or ground water supply systems.

1.3 Equipment

The following equipment may be used during the conduct of an aquifer pumping test:

- field log book or pump test field form;
- water level indicators;
- pressure transducers;
- data logging equipment;
- hourly data from local source if no on-site data is available
- field printer;
- laptop computer;
- duct tape;
- deionized water;
- submersible pump with flow regulator and foot valve;
- flow meter/totalizer;
- generator or other power source;
- heavy-duty extension cords;
- polyethylene sheeting;
- frac tank, baker tank, or other storage vessel, if water requires containment;
- Personal Protective Equipment (PPE) and air monitoring equipment per HASP;
- portable two-way radios;
- well completion logs;
- well keys;
- flow meter/graduated bucket; and
- stopwatch.

2. PROCEDURES

The following general procedures should be used for conducting a pumping test. Alterations of these general procedures may be necessary in order to accommodate site specific conditions and data requirements.

Aquifer pumping tests should follow the set-up procedures listed below in order to consistently record the desired data as accurately as possible.

1. Determine the appropriate lengths of transducer cables based on the distances from pumping to observation wells. Based on the well geometries, determine the appropriate pressure-rated transducer, number of logging channels needed, required pump hosing length, pump capacity and type, and minimum and maximum anticipated pumping rates. Identify the test control location and create a pre-test schematic of where the wells are, depth of transducer and pump settings, where the water will be discharged or containerized, and how the test can be implemented efficiently before going into the field. If sealed (unvented) transducers are used, an additional transducer will be required to monitor and correct for atmospheric pressure. If vented transducers are used, variations in atmospheric pressure will automatically be accounted for; however, if the tested aquifer is susceptible to atmospheric pumping, monitoring of atmospheric pressure may be required to help interpret water level data.
2. Conduct decontamination of all downhole test equipment and wrap all equipment in polyethylene sheeting or bags. These should be dedicated and labeled for the intended wells.
3. After donning PPE and performing any required air monitoring per the HASP, measure water levels in all of the wells to be monitored during the test. Record the water levels in the logbook or on the pump test log. It is recommended that the water levels be monitored for a period of time prior to the test to identify any trends of rising or falling water levels due to nearby supply wells, tidal influence, or surface water bodies. If possible, the test should not be initiated within several days of large rainfall event (past or predicted).
4. Set and secure the pump in the pumping well at the planned depth and allow for stabilization of the displaced water level caused by insertion. The generator should be filled with gasoline at a remote down-wind location and extension cord run to this location. Record the pump depth in the log book or on the pump test log. Monitor the water level in the pumping well to ensure that static levels are attained.

5. Secure the transducers with duct tape in the desired wells at the planned depths as identified in the pre-test schematic. Set all transducers in the wells for a minimum of two hours to allow for reaching equilibrium with ground water temperature and for cables to stretch fully. The transducer in the pumping well should be set above the pump. Run all of the transducer cables to the test control location and connect them to the data logger in the desired channel(s). Record the transducer depths in the logbook or on the pump test log.

6. While the transducers are stabilizing, programming of the data logger for each channel should be completed with the specific parameters for each transducer. Scale factors, linearity, offset, well identification, reference level, and type of reading (surface or top of casing) should be selected. These parameters are specific to each transducer and data logger and are usually clearly identified on the wheel and cable for each transducer. After programming, each transducer should be tested for accuracy by raising it a known distance and verifying that the change in measured water level corresponds with this distance. If a long-term pumping test is conducted (i.e. several weeks) checking transducers in this manner once per week is warranted.

7. The data logger should be programmed to collect readings at the desired interval(s) for the entire duration of the test including recovery. The test should be programmed to allow for logging of water levels during the drawdown and recovery stages using the logarithmic option recommended with most data loggers. The actual log scale can also be modified to suit the needs of the test, if desired. The data logger should be programmed to start prior to initiation of pumping the well (but not so early that the recording interval is too long when pumping begins).

8. Once the test equipment is ready, the entries, well identifications, and parameters for each channel should then be double checked for accuracy. The connections to all channels should be checked by communication with each individual transducer.

9. The startup of the pump should be synchronized with the logging of water level data. The rate of pumping should be set at the desired rate as determined by an earlier step test. The rate should be stabilized as quickly as possible to promote accurate data analysis. Direct the discharge to the appropriate containers, if required, or to a location outside of the anticipated cone of influence. The pumping rate should be measured and recorded routinely (using a flow meter and/or a bucket test) during initial pumping to confirm that the rate is stable. All

adjustments to the rate should be recorded. Record the actual start time and pumping rate of the test in the logbook or on the test log.

10. Monitor the channels of the data logger to read the transducers. Look for drawdown in the pumping well to confirm operation. Monitor the transducers in the observation wells to confirm their operation. Manual measurement of the water levels should be performed periodically to confirm the accuracy of the transducer data, typically several times during the first day, daily for several days, and weekly thereafter.

11. If a recovery test is also planned, re-program the data-loggers to begin a new logarithmic data collection cycle, shut down the pump, record the time and allow the water level in the pumping well and nearby monitoring wells to recover to 75 to 90 percent of static levels.

12. Once the test is completed, remove and decontaminate all downhole equipment.

APPENDIX B

Boring and Well Construction Logs

Geosyntec consultants

Client:	**Hercules**		**WELL LOG**
Project:	**Brunswick/Pinova Facility**	**Well No.**	**APT-01**
Address:	**2801 Cook Street, Brunswick, GA**	**Page:**	**1 of 5**

Drilling Start Date:	**2/26/20**	Boring Depth (ft):	**97.0**	Well Depth (ft):	**95.0**
Drilling End Date:	**2/27/20**	Boring Diameter (in):	**10.00**	Well Diameter (in):	**6.0**
Drilling Company:	**Saedacco**	Sampling Method(s):	**Core recovery**	Screen Slot (in):	**0.020**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150 LS**	DTW After Drilling (ft):		Screen Material:	**Wire-wrap stainless steel**
Driller:	**Will Keyes**	Ground Elev. (ft):	**6.81**	Seal Material(s):	**Bent. Slurry/Bent. Pellets**
Logged By:	**Ben Weinmann**	Location (X,Y):	**425185.29, 872100.41,**	Filter Type:	**5/16**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0								(0-5') Hand auger			0
5								(5') Poorly graded SAND (SP); mostly medium grained sand, few clay, loose, moist, very dark brown (7.5YR 2.5/2), minor organic content (roots)			5
10								(7') Poorly graded SAND (SP); mostly fine-medium grained sand, few clay, loose, moist, pale yellow (2.5Y 8/2), minor micas	0.2		10
15								(11') Sandy lean CLAY (CL); little fine sand, mostly clay, medium plasticity, soft, moist, dark gray (10YR 4/1) (11.5') Poorly graded SAND (SP); mostly fine-medium grained sand, few clay, loose, moist, dark gray (10YR 4/1) (13') Poorly graded SAND (SP); mostly fine-medium grained sand, loose, moist, dark gray (10YR 4/1), with coarse to very coarse shells (14') Poorly graded SAND (SP); mostly medium grained sand, loose, moist, greenish-gray	1.4 1.1		15
20								(18') Sandy lean CLAY (CL); little fine-medium sand, mostly clay, medium plasticity, soft, moist, dark greenish-gray, with sand lenses	1.3 0.8		20

NOTES: Hole precleared using hand auger. The casing was 20 slot, stainless steel

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. APT-01
	Address: 2801 Cook Street, Brunswick, GA	Page: 2 of 5

Drilling Start Date:	**2/26/20**	Boring Depth (ft):	**97.0**	Well Depth (ft):	**95.0**
Drilling End Date:	**2/27/20**	Boring Diameter (in):	**10.00**	Well Diameter (in):	**6.0**
Drilling Company:	**Saedacco**	Sampling Method(s):	**Core recovery**	Screen Slot (in):	**0.020**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150 LS**	DTW After Drilling (ft):		Screen Material:	**Wire-wrap stainless steel**
Driller:	**Will Keyes**	Ground Elev. (ft):	**6.81**	Seal Material(s):	**Bent. Slurry/Bent. Pellets**
Logged By:	**Ben Weinmann**	Location (X,Y):	**425185.29, 872100.41,**	Filter Type:	**5/16**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
20								(18') Sandy lean CLAY (CL); little fine-medium sand, mostly clay, medium plasticity, soft, moist, dark greenish-gray, with sand lenses (20.5') Poorly graded SAND (SP); mostly fine-medium grained sand, loose, moist, dark greenish-gray	0.4		20
25								(23.5') Sandy lean CLAY (CL); little fine sand, mostly clay, medium plasticity, soft, moist, dark greenish-gray	0.8 1.0 0.1		25
30								(29.5') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, greenish-gray, with minor shells	1.5 1.8		30
35								(33') Poorly graded SAND (SP); mostly medium grained sand, loose, moist, greenish-gray (35') Lean CLAY (CL); mostly clay, medium plasticity, soft, moist, greenish-gray (35.5') Poorly graded SAND (SP); mostly coarse grained sand, loose, moist, greenish-gray	1.2		35
40								(37.5') Poorly graded SAND (SP); mostly fine-medium grained sand, some clay, loose, moist, greenish-gray (38') Poorly graded SAND (SP); mostly coarse grained sand, loose, moist, greenish-gray, with shells to 45.5'	9.4 7.3		40

NOTES: Hole precleared using hand auger. The casing was 20 slot, stainless steel

Geosyntec consultants

Client:	**Hercules**		**WELL LOG**
Project:	**Brunswick/Pinova Facility**	**Well No.**	**APT-01**
Address:	**2801 Cook Street, Brunswick, GA**	**Page:**	**3 of 5**

Drilling Start Date:	**2/26/20**	Boring Depth (ft):	**97.0**	Well Depth (ft):	**95.0**
Drilling End Date:	**2/27/20**	Boring Diameter (in):	**10.00**	Well Diameter (in):	**6.0**
Drilling Company:	**Saedacco**	Sampling Method(s):	**Core recovery**	Screen Slot (in):	**0.020**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150 LS**	DTW After Drilling (ft):		Screen Material:	**Wire-wrap stainless steel**
Driller:	**Will Keyes**	Ground Elev. (ft):	**6.81**	Seal Material(s):	**Bent. Slurry/Bent. Pellets**
Logged By:	**Ben Weinmann**	Location (X,Y):	**425185.29, 872100.41,**	Filter Type:	**5/16**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
40								(38') Poorly graded SAND (SP); mostly coarse grained sand, loose, moist, greenish-gray, with shells to 45.5'	4.1		40
									16.8		
45								(46.5') Poorly graded SAND (SP); mostly medium grained sand, loose, moist, greenish-gray			45
									16.2		
50								(49') Poorly graded SAND (SP); mostly coarse grained sand, loose, moist, greenish-gray, slight chemical odor	14.3		50
									21.6		
									6.1		
55											55
								(58') Poorly graded SAND (SP); mostly fine-medium grained sand, some clay, medium dense, moist, greenish-gray	4.1		
60									0.4		60

NOTES: Hole precleared using hand auger. The casing was 20 slot, stainless steel

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. APT-01
	Address: 2801 Cook Street, Brunswick, GA	Page: 4 of 5

Drilling Start Date:	**2/26/20**	Boring Depth (ft):	**97.0**	Well Depth (ft):	**95.0**
Drilling End Date:	**2/27/20**	Boring Diameter (in):	**10.00**	Well Diameter (in):	**6.0**
Drilling Company:	**Saedacco**	Sampling Method(s):	**Core recovery**	Screen Slot (in):	**0.020**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150 LS**	DTW After Drilling (ft):		Screen Material:	**Wire-wrap stainless steel**
Driller:	**Will Keyes**	Ground Elev. (ft):	**6.81**	Seal Material(s):	**Bent. Slurry/Bent. Pellets**
Logged By:	**Ben Weinmann**	Location (X,Y):	**425185.29, 872100.41,**	Filter Type:	**5/16**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
60								(58') Poorly graded SAND (SP); mostly fine-medium grained sand, some clay, medium dense, moist, greenish-gray			60
								(62') Poorly graded SAND (SP); mostly medium-coarse grained sand, few fine gravel, loose, moist, dark greenish-gray, chemical odor present; color darkens below 68'	26.4		
65									26.0		65
									8.3		
70									19.5		70
									26.0		
75									36.5		75
									18.7		
				SH	09:10		0.00	(77') No Recovery - attempted Shelby Tube sample	1.7		
								(79') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, dark greenish-gray	2.8		
80											80

NOTES: Hole precleared using hand auger. The casing was 20 slot, stainless steel

Geosyntec consultants

Client:	**Hercules**		**WELL LOG**
Project:	**Brunswick/Pinova Facility**	**Well No.**	**APT-01**
Address:	**2801 Cook Street, Brunswick, GA**	**Page:**	**5 of 5**

Drilling Start Date:	**2/26/20**	Boring Depth (ft):	**97.0**	Well Depth (ft):	**95.0**
Drilling End Date:	**2/27/20**	Boring Diameter (in):	**10.00**	Well Diameter (in):	**6.0**
Drilling Company:	**Saedacco**	Sampling Method(s):	**Core recovery**	Screen Slot (in):	**0.020**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150 LS**	DTW After Drilling (ft):		Screen Material:	**Wire-wrap stainless steel**
Driller:	**Will Keyes**	Ground Elev. (ft):	**6.81**	Seal Material(s):	**Bent. Slurry/Bent. Pellets**
Logged By:	**Ben Weinmann**	Location (X,Y):	**425185.29, 872100.41,**	Filter Type:	**5/16**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
80								(79') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, dark greenish-gray	10.5		80
									12.2		
85				SH	09:11		0.00	(85') No Recovery - attempted Shelby Tube sample	8.9		85
								(87') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, greenish-gray, slight chemical odor	20.5		
90									22.6		90
									30.2		
									16.4		
95								(95') Sandy SILT (ML); little fine-medium sand, mostly silt, low plasticity, stiff, dry, light olive gray (5Y 6/2), slight chemical odor; trace rounded coarse sand	5.4		95
								(97') Boring terminated	1.1		
100											100

NOTES: Hole precleared using hand auger. The casing was 20 slot, stainless steel

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-01
	Address: 2801 Cook Street, Brunswick, GA	Page: 1 of 5

Drilling Start Date:	3/2/20	Boring Depth (ft):	90.0	Well Depth (ft):	90.0
Drilling End Date:	3/2/20	Boring Diameter (in):	6.00	Well Diameter (in):	6.0
Drilling Company:	Saedacco	Sampling Method(s):	Core recovery	Screen Slot (in):	0.010
Drilling Method:	Sonic	DTW During Drilling (ft):		Riser Material:	Sch 40 PVC
Drilling Equipment:	Geoprobe 8150LS	DTW After Drilling (ft):		Screen Material:	Sch 40 PVC slotted
Driller:	Will Keyes	Ground Elev. (ft):	6.65	Seal Material(s):	Bent. Slurry/Bent. Pellets
Logged By:	Ben Weinmann	Location (X,Y):	425139.32, 872120.32	Filter Type:	#3

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	#3 DEPTH (ft)
0								(0-5') Hand auger			0
5								(5') Poorly graded SAND (SP); mostly fine-medium grained sand, some clay, loose, moist, greenish-gray, minor organic fragments	2.2		5
									2.1		
								(8') Poorly graded SAND (SP); mostly fine-medium grained sand, medium dense, moist, medium tan-brown, slightly micaceous	0.3		
10									2.9		10
								(11') Poorly graded SAND (SP); mostly fine-medium grained sand, few clay, loose, moist, dark brown, slightly micaceous	2.8		
15								(14') Poorly graded SAND (SP); mostly fine-medium grained sand, loose, moist, dark greenish-brown, abundant shells and shell fragments	3.3		15
									0.8		
20									1.6		20

NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-01
	Address: 2801 Cook Street, Brunswick, GA	Page: 2 of 5

Drilling Start Date:	3/2/20	Boring Depth (ft):	90.0	Well Depth (ft):	90.0
Drilling End Date:	3/2/20	Boring Diameter (in):	6.00	Well Diameter (in):	2.0
Drilling Company:	Saedacco	Sampling Method(s):	Core recovery	Screen Slot (in):	0.010
Drilling Method:	Sonic	DTW During Drilling (ft):		Riser Material:	Sch 40 PVC
Drilling Equipment:	Geoprobe 8150LS	DTW After Drilling (ft):		Screen Material:	Sch 40 PVC slotted
Driller:	Will Keyes	Ground Elev. (ft):	6.65	Seal Material(s):	Bent. Slurry/Bent. Pellets
Logged By:	Ben Weinmann	Location (X,Y):	425139.32, 872120.32	Filter Type:	#3

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
20								(19.5') Poorly graded SAND (SP); mostly fine-medium grained sand, few clay, medium dense, moist, dark greenish-gray, minor shells	3.3		20
25								(24') Sandy lean CLAY (CL); some fine-medium sand, mostly clay, medium plasticity, soft, moist, dark greenish-gray	2.3		25
								(26') Poorly graded SAND (SP); mostly fine-medium grained sand, medium dense, moist, greenish-gray (27') Sandy lean CLAY (CL); some fine-medium sand, mostly clay, medium plasticity, soft, moist, dark greenish-gray	0.7		
30								(30.5') Poorly graded SAND (SP); mostly medium grained sand, loose, moist, light greenish-gray	1.7		30
									1.7		
35									4.1		35
								(36.5') Lean CLAY (CL); mostly clay, medium plasticity, soft, moist, light greenish-gray (37') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, greenish-gray, wet at 38.5	3.3		
40									0.2		40
									1.9		

NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-01
	Address: 2801 Cook Street, Brunswick, GA	Page: 3 of 5

Drilling Start Date:	3/2/20	Boring Depth (ft):	90.0	Well Depth (ft):	90.0
Drilling End Date:	3/2/20	Boring Diameter (in):	6.00	Well Diameter (in):	2.0
Drilling Company:	Saedacco	Sampling Method(s):	Core recovery	Screen Slot (in):	0.010
Drilling Method:	Sonic	DTW During Drilling (ft):		Riser Material:	Sch 40 PVC
Drilling Equipment:	Geoprobe 8150LS	DTW After Drilling (ft):		Screen Material:	Sch 40 PVC slotted
Driller:	Will Keyes	Ground Elev. (ft):	6.65	Seal Material(s):	Bent. Slurry/Bent. Pellets
Logged By:	Ben Weinmann	Location (X,Y):	425139.32, 872120.32	Filter Type:	#3

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
40								(37') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, greenish-gray, wet at 38.5	2.6		40
									4.4		
45									5.8		45
									8.7		
50								(51') Poorly graded SAND (SP); mostly medium grained sand, loose, moist, greenish-gray	18.0		50
									16.7		
55									16.7		55
								(57') Poorly graded SAND (SP); mostly medium-coarse grained sand, few fine gravel, loose, moist, greenish-gray, chemical odor at ~58'	11.6		
									40.6		
60									2.0		60

NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-01
	Address: 2801 Cook Street, Brunswick, GA	Page: 4 of 5

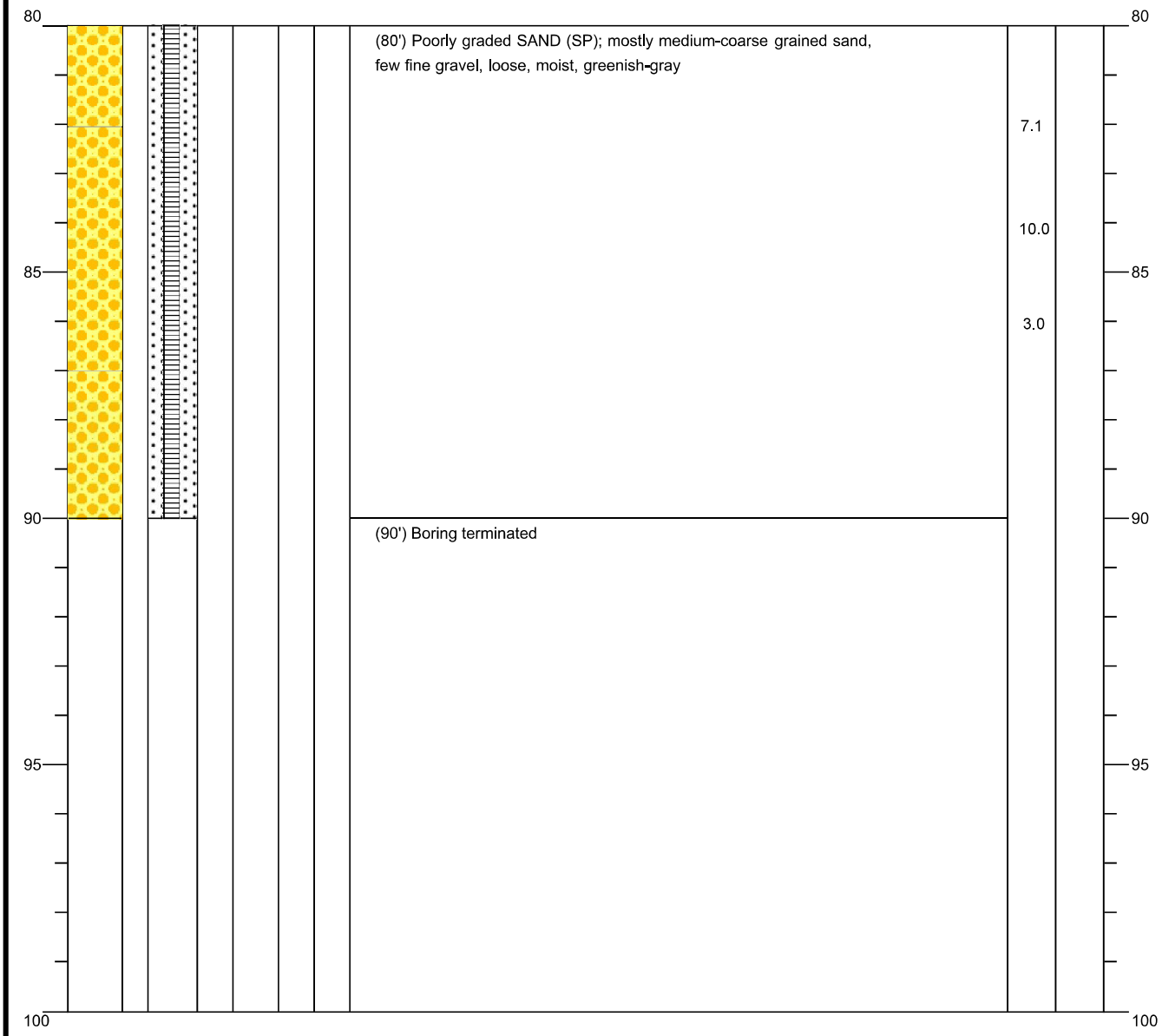
Drilling Start Date:	**3/2/20**	Boring Depth (ft):	**90.0**	Well Depth (ft):	**90.0**
Drilling End Date:	**3/2/20**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**Saedacco**	Sampling Method(s):	**Core recovery**	Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):		Screen Material:	**Sch 40 PVC slotted**
Driller:	**Will Keyes**	Ground Elev. (ft):	**6.65**	Seal Material(s):	**Bent. Slurry/Bent. Pellets**
Logged By:	**Ben Weinmann**	Location (X,Y):	**425139.32, 872120.32**	Filter Type:	**#3**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
60								(60') Poorly graded SAND (SP); mostly medium-coarse grained sand, few fine gravel, loose, moist, greenish-gray			60
									1.0		
									12.3		
65											65
									22.3		
									18.3		
70									26.8		70
									13.7		
									4.5		
75											75
									23.8		
									12.5		
80									13.1		80

NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-01
	Address: 2801 Cook Street, Brunswick, GA	Page: 5 of 5

Drilling Start Date:	3/2/20	Boring Depth (ft):	90.0	Well Depth (ft):	90.0
Drilling End Date:	3/2/20	Boring Diameter (in):	6.00	Well Diameter (in):	2.0
Drilling Company:	Saedacco	Sampling Method(s):	Core recovery	Screen Slot (in):	0.010
Drilling Method:	Sonic	DTW During Drilling (ft):		Riser Material:	Sch 40 PVC
Drilling Equipment:	Geoprobe 8150LS	DTW After Drilling (ft):		Screen Material:	Sch 40 PVC slotted
Driller:	Will Keyes	Ground Elev. (ft):	6.65	Seal Material(s):	Bent. Slurry/Bent. Pellets
Logged By:	Ben Weinmann	Location (X,Y):	425139.32, 872120.32	Filter Type:	#3



NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants

Client:	**Hercules**		**WELL LOG**
Project:	**Brunswick/Pinova Facility**	**Well No.**	**PWOW-02**
Address:	**2801 Cook Street, Brunswick, GA**	**Page:**	**1 of 5**

Drilling Start Date:	**3/3/20**	Boring Depth (ft):	**90.0**	Well Depth (ft):	**90.0**
Drilling End Date:	**3/3/20**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**Saeddacco**	Sampling Method(s):	**Core recovery**	Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):		Screen Material:	**Sch 40 PVC slotted**
Driller:	**Will Keyes**	Ground Elev. (ft):	**6.53**	Seal Material(s):	**Bent. Slurry/Bent. Pellets**
Logged By:	**Ben Weinmann**	Location (X,Y):	**425107.94, 872158.61**	Filter Type:	**#3**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0								(0-5') Hand auger			0
5								(5') Poorly graded SAND (SP); mostly fine-medium grained sand, little clay, dense, moist, medium brow, contains roots and has the scent of swamp	2.4		5
								(7') Poorly graded SAND (SP); mostly fine-medium grained sand, few clay, medium dense, moist, light tan-brown, slightly micaceous	10.1		
								(8') Poorly graded SAND (SP); mostly fine-medium grained sand, some clay, medium dense, moist, brown			
10								(9.5') Poorly graded SAND (SP); mostly fine-coarse grained sand, loose, moist, greenish-brown, shells fragments	9.5		10
									11.1		
									6.9		
15											15
								(16') Poorly graded SAND (SP); mostly fine-medium grained sand, medium dense, moist, greenish-gray, minor shell fragments	3.2		
									4.1		
20									3.9		20

NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-02
	Address: 2801 Cook Street, Brunswick, GA	Page: 2 of 5

Drilling Start Date:	**3/3/20**	Boring Depth (ft):	**90.0**	Well Depth (ft):	**90.0**
Drilling End Date:	**3/3/20**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**Saeddacco**	Sampling Method(s):	**Core recovery**	Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):		Screen Material:	**Sch 40 PVC slotted**
Driller:	**Will Keyes**	Ground Elev. (ft):	**6.53**	Seal Material(s):	**Bent. Slurry/Bent. Pellets**
Logged By:	**Ben Weinmann**	Location (X,Y):	**425107.94, 872158.61**	Filter Type:	**#3**

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
20								(16') Poorly graded SAND (SP); mostly fine-medium grained sand, medium dense, moist, greenish-gray, minor shell fragments			20
								(21.5') Lean CLAY with sand (CL); little fine-medium sand, mostly clay, medium plasticity, soft, moist, greenish-gray	3.8		
								(22.5') Poorly graded SAND (SP); mostly fine-medium grained sand, loose, moist, greenish-gray	1.3		
25									1.7		25
								(27') Lean CLAY with sand (CL); little fine-medium sand, mostly clay, medium plasticity, soft, moist, greenish-gray			
								(28') Poorly graded SAND (SP); mostly fine-medium grained sand, some clay, medium dense, moist, greenish-gray	1.6		
								(29') Poorly graded SAND (SP); mostly fine-medium grained sand, loose, moist, light greenish-gray, shell fragments present	0.9		
30									3.1		30
									2.2		
35									2.5		35
								(38') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, greenish-gray, chemical odor	2.9		
40									6.8		40

NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-02
	Address: 2801 Cook Street, Brunswick, GA	Page: 3 of 5

Drilling Start Date:	3/3/20	Boring Depth (ft):	90.0	Well Depth (ft):	90.0
Drilling End Date:	3/3/20	Boring Diameter (in):	6.00	Well Diameter (in):	2.0
Drilling Company:	Saeddacco	Sampling Method(s):	Core recovery	Screen Slot (in):	0.010
Drilling Method:	Sonic	DTW During Drilling (ft):		Riser Material:	Sch 40 PVC
Drilling Equipment:	Geoprobe 8150LS	DTW After Drilling (ft):		Screen Material:	Sch 40 PVC slotted
Driller:	Will Keyes	Ground Elev. (ft):	6.53	Seal Material(s):	Bent. Slurry/Bent. Pellets
Logged By:	Ben Weinmann	Location (X,Y):	425107.94, 872158.61	Filter Type:	#3

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
40								(38') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, greenish-gray, chemical odor			40
								(40,5') Lean CLAY (CL); mostly clay, medium plasticity, soft, moist, light greenish-gray	6.0		
								(41') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, light greenish-gray	6.1		
45									3.9		45
									10.6		
50									17.6		50
									22.3		
								(53') Poorly graded SAND (SP); mostly fine-coarse grained sand, few fine gravel, little clay, loose, moist, greenish-gray	16.1		
55									17.6		55
								(57') No Recovery	19.0		
60											60

NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-02
	Address: 2801 Cook Street, Brunswick, GA	Page: 4 of 5

Drilling Start Date:	3/3/20	Boring Depth (ft):	90.0	Well Depth (ft):	90.0
Drilling End Date:	3/3/20	Boring Diameter (in):	6.00	Well Diameter (in):	2.0
Drilling Company:	Saeddacco	Sampling Method(s):	Core recovery	Screen Slot (in):	0.010
Drilling Method:	Sonic	DTW During Drilling (ft):		Riser Material:	Sch 40 PVC
Drilling Equipment:	Geoprobe 8150LS	DTW After Drilling (ft):		Screen Material:	Sch 40 PVC slotted
Driller:	Will Keyes	Ground Elev. (ft):	6.53	Seal Material(s):	Bent. Slurry/Bent. Pellets
Logged By:	Ben Weinmann	Location (X,Y):	425107.94, 872158.61	Filter Type:	#3

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
60								(60') Well-graded SAND (SW); mostly medium-coarse grained sand, few fine gravel, loose, moist, greenish-gray			60
								(62') No Recovery	17.5		
								(63.5') Poorly graded SAND (SP); mostly medium-coarse grained sand, few fine gravel, little clay, dense, moist, gray, laminations present at 66' variably tan, grey, and brown	20.8		
65											65
								(66') Well-graded SAND (SW); mostly medium-coarse grained sand, few fine gravel, loose, moist, greenish-brown	20.9		
								(67') No Recovery			
								(69') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, greenish-gray	20.4		
70											70
									24.7		
									6.3		
75											75
									3.8		
									10.1		
80									18.9		80

NOTES: Hole precleared to 5.0' using hand auger.

Geosyntec consultants	Client: Hercules	WELL LOG
	Project: Brunswick/Pinova Facility	Well No. PWOW-02
	Address: 2801 Cook Street, Brunswick, GA	Page: 5 of 5

Drilling Start Date:	3/3/20	Boring Depth (ft):	90.0	Well Depth (ft):	90.0
Drilling End Date:	3/3/20	Boring Diameter (in):	6.00	Well Diameter (in):	2.0
Drilling Company:	Saeddacco	Sampling Method(s):	Core recovery	Screen Slot (in):	0.010
Drilling Method:	Sonic	DTW During Drilling (ft):		Riser Material:	Sch 40 PVC
Drilling Equipment:	Geoprobe 8150LS	DTW After Drilling (ft):		Screen Material:	Sch 40 PVC slotted
Driller:	Will Keyes	Ground Elev. (ft):	6.53	Seal Material(s):	Bent. Slurry/Bent. Pellets
Logged By:	Ben Weinmann	Location (X,Y):	425107.94, 872158.61	Filter Type:	#3

DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
80								(80') Poorly graded SAND (SP); mostly medium-coarse grained sand, loose, moist, greenish-gray	14.7		80
									16.7		
85									6.4		85
90								(90') Boring terminated			90
95											95
100											100

NOTES: Hole precleared to 5.0' using hand auger.

APPENDIX C

APT-01 Groundwater Quality Data During Step-Drawdown Test

Geosyntec Consultants

Ground Water Sampling Measurements for Low-Flow Purging

Site: Hercules - Pinova Brunswick Plant
Monitoring Well: APT - 1
Sample ID: —

Geosyntec Project No.: GR6881
Sampling Date: 3/12/2020
Sampler: Nardos Tilahun

Time	Start Purge	Readings	Start Samp.	End Samp.	Temperature (°C)	pH (ATC)	Redox Potential (± mv)	Conductivity (mS/cm) (ATC)	Turbidity (NTU)	DO (mg/L)	Appearance of Water / Salinity
1300	x										
1305		x			22.12	6.29	-14	12.6	6.77	6.37	0.73% Salt, 3.4 ST
1405		x			22.79	6.20	-45	12.6	3.19	5.08	0.72% Salt, 3.2 ST
1500		x	x	x	22.42	6.27	-27	13.0	6.24	6.78	0.75% Salt, 3.5 ST
1605		x			22.66	6.20	-53	13.0	1.39	3.94	0.75% Salt, 3.4 ST
1705		x	x	x	22.59	6.20	-53	12.9	1.91	2.33	0.74% Salt, 3.4 ST
1805		x			22.13	6.19	-53	13.1	0.45	1.98	0.75% Salt, 3.6 ST
1905		x			22.08	6.18	-54	13.2	0.73	2.00	0.76% Salt, 3.6 ST
2008		x	x	x	21.34	6.15	-51	13.3	2.44	2.44	0.77% Salt, 3.9 ST

Meter Calibration

Meter Number: _____

Parameter	Date & Time Calibrated	Calibration Results
pH	_____	pH 4: _____; pH 7: _____; pH 10: _____ (ATC)
Conductivity	_____	_____ mS/cm fluid reads _____ (ATC)
Redox Pot.	_____	+231 mv Zoebell solution reads _____

Split, Blank, Duplicate, & Filtered Samples

Sample ID	Description
PT-03-03122020	17 bottles / Containers
PT-02-03122020	»
PT-01-03122020	»
01-PT-03122020	8 containers

Miscellaneous

Depth to Water: _____ ft
Turbidity: _____ NTUs
Dis. Oxygen: _____ ppm
Pump Rate: _____ in
_____ min, _____ sec.

Weather: 57-81°F, Mostly Sunny

Notes: (well condition, nearby activities or changes in land use, odors, problems, deviations from plan, etc.)

APPENDIX D

Groundwater Laboratory Analytical Report

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-181592-1
Client Project/Site: Ashland - Brunswick

For:
Geosyntec Consultants, Inc.
1255 Roberts Blvd, NW
Suite 200
Kennesaw, Georgia 30144

Attn: Laura Kinsman

Authorized for release by:
4/23/2020 11:23:03 AM

Jerry Lanier, Project Manager I
(912)250-0281
jerry.lanier@testamericainc.com

Table of Contents

Job ID: 680-181592-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE

Client: Geosyntec Consultants, Inc.

Project: Ashland - Brunswick

Report Number: 680-181592-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT
The samples were received on 3/14/2020 10:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 4.7º C.

TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)
Sample 01-PT-03122020 (680-181592-4) was analyzed for TCLP volatile organic compounds (GC-MS) in accordance with EPA SW-846 Methods 1311/8260B. The samples were leached on 03/26/2020 and analyzed on 03/27/2020.

Sample 01-PT-03122020 (680-181592-4)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 680-612631 and analytical batch 680-612806.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)
Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2), PT-01-03122020 (680-181592-3) and Trip Blank (680-181592-5) were analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 03/25/2020 and 04/10/2020.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 680-612405 recovered outside control limits for the following analytes: Tetrachloroethene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Reanalysis of the following samples were performed outside of the analytical holding time due to dilution: PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3).

Samples PT-03-03122020 (680-181592-1)[5X], PT-02-03122020 (680-181592-2)[5X] and PT-01-03122020 (680-181592-3)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 680-614683.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PESTICIDES (TCLP)
Sample 01-PT-03122020 (680-181592-4) was analyzed for Pesticides (TCLP) in accordance with EPA SW-846 Method

Job ID: 680-181592-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

1311/8081B_8082A. The samples were leached on 03/25/2020, prepared on 03/30/2020 and analyzed on 04/07/2020.

This method incorporates 2nd column confirmation. Corrective action is not taken for surrogate/spike compounds unless results from both columns are unacceptable. Results outside criteria are qualified.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PESTICIDES AND PCBS

Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for Pesticides and PCBs in accordance with EPA SW-846 Method 8081B_8082A. The samples were prepared on 03/19/2020 and analyzed on 03/25/2020.

This method incorporates 2nd column confirmation. Corrective action is not taken for surrogate/spike compounds unless results from both columns are unacceptable. Results outside criteria are qualified.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS) - DISSOLVED

Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for Metals (ICPMS) - Dissolved in accordance with EPA SW-846 Method 6020A. The samples were prepared on 03/19/2020 and analyzed on 03/20/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ALKALINITY

Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for alkalinity in accordance with SM 2320B. The samples were analyzed on 03/25/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS

Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for total dissolved solids in accordance with SM 2540C. The samples were analyzed on 03/18/2020.

The oven temperature for the following samples was outside of Method/SOP criteria of 180 ± 2 degrees Celcius: PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2), PT-01-03122020 (680-181592-3), (LCS 680-611460/2), (LCSD 680-611460/3), and (MB 680-611460/1). The QC samples passed criteria. Results have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SUSPENDED SOLIDS

Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for total suspended solids in accordance with SM 2540D. The samples were analyzed on 03/18/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS BY ION CHROMATOGRAPHY (28 DAY)

Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for Anions by Ion Chromatography (28 Day) in accordance with EPA Method 300.0. The samples were analyzed on 03/21/2020 and 03/24/2020.

Samples PT-03-03122020 (680-181592-1)[100X], PT-02-03122020 (680-181592-2)[100X] and PT-01-03122020 (680-181592-3)[100X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 680-181592-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

ANIONS BY ION CHROMATOGRAPHY (48 HOUR)
Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for Anions by Ion Chromatography (48 Hour) in accordance with EPA Method 300.0. The samples were analyzed on 03/18/2020.

The following samples were received by the lab outside of the 48 hour holding time: PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3).

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DISSOLVED ORGANIC CARBON
Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for dissolved organic carbon in accordance with EPA SW-846 Method 9060. The samples were analyzed on 03/25/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON
Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for total organic carbon in accordance with EPA SW-846 Method 9060A. The samples were analyzed on 03/20/2020.

Samples were laboratory-filtered and preserved, and not field-filtered and preserved within two hours of collection, per the SOP.
PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2), PT-01-03122020 (680-181592-3), (680-181592-M-1-B MS) and (680-181592-M-1-C MSD)

Particulates larger than the syringe were present in the sample. An aliquot of the sample was transfered to a single-use non-preserve 40mL vial to prevent clogging, per the SOP.
PT-02-03122020 (680-181592-2)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL HARDNESS (AS CACO3) BY CALCULATION
Samples PT-03-03122020 (680-181592-1), PT-02-03122020 (680-181592-2) and PT-01-03122020 (680-181592-3) were analyzed for total hardness (as CaCO3) by calculation in accordance with SM 2340B. The samples were analyzed on 03/25/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-181592-1	PT-03-03122020	Water	03/12/20 20:20	03/14/20 10:25	
680-181592-2	PT-02-03122020	Water	03/12/20 17:00	03/14/20 10:25	
680-181592-3	PT-01-03122020	Water	03/12/20 15:00	03/14/20 10:25	
680-181592-4	01-PT-03122020	Water	03/12/20 17:00	03/14/20 10:25	
680-181592-5	Trip Blank	Water	03/12/20 00:00	03/14/20 10:25	

Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
8081B/8082A	Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography	SW846	TAL SAV
300.0-1993 R2.1	Anions, Ion Chromatography	MCAWW	TAL SAV
6020A	Metals (ICP/MS)	SW846	TAL SAV
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	TAL SAV
2320B-2011	Alkalinity, Total	SM	TAL SAV
2540 D-2011	Total Suspended Solids (Dried at 103-105°C)	SM	TAL SAV
2540C-2011	Total Dissolved Solids (Dried at 180 °C)	SM	TAL SAV
9060	Organic Carbon, Dissolved (DOC)	SW846	TAL SAV
9060A	Organic Carbon, Total (TOC)	SW846	TAL SAV
1311	TCLP Extraction	SW846	TAL SAV
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL SAV
3520C	Liquid-Liquid Extraction (Continuous)	SW846	TAL SAV
5030B	Purge and Trap	SW846	TAL SAV
FILTRATION	Sample Filtration	None	TAL SAV

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
E	Result exceeded calibration range.
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

GC Semi VOA

Qualifier	Qualifier Description
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.
U	Indicates the analyte was analyzed for but not detected.

HPLC/IC

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: PT-03-03122020 — Lab Sample ID: 680-181592-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	410	E	1.0		ug/L	1		8260B	Total/NA
Chlorobenzene	310	E	1.0		ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	3.0		1.0		ug/L	1		8260B	Total/NA
1,2-Dichlorobenzene	2.0		1.0		ug/L	1		8260B	Total/NA
1,4-Dichlorobenzene	2.9		1.0		ug/L	1		8260B	Total/NA
Ethylbenzene	5.7		1.0		ug/L	1		8260B	Total/NA
Toluene	2.2		1.0		ug/L	1		8260B	Total/NA
Xylenes, Total	150		1.0		ug/L	1		8260B	Total/NA
Vinyl chloride	3.2		1.0		ug/L	1		8260B	Total/NA
Benzene - DL	290	H	5.0		ug/L	5		8260B	Total/NA
Chlorobenzene - DL	200	H	5.0		ug/L	5		8260B	Total/NA
Fluoride	0.14		0.10		mg/L	1		300.0-1993 R2.1	Total/NA
Sulfate	3.8		1.0		mg/L	1		300.0-1993 R2.1	Total/NA
Chloride - DL	4100		50		mg/L	100		300.0-1993 R2.1	Total/NA
Iron	12000		100		ug/L	1		6020A	Dissolved
Manganese	990		5.0		ug/L	1		6020A	Dissolved
Zinc	450		20		ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	5400		3.3		mg/L	1		SM 2340B	Total/NA
Calcium hardness as calcium carbonate	5000		1.2		mg/L	1		SM 2340B	Total/NA
Magnesium hardness as calcium carbonate	360		2.1		mg/L	1		SM 2340B	Total/NA
Alkalinity	330		5.0		mg/L	1		2320B-2011	Total/NA
Bicarbonate Alkalinity as CaCO3	330		5.0		mg/L	1		2320B-2011	Total/NA
Carbon Dioxide, Free	66		5.0		mg/L	1		2320B-2011	Total/NA
Bicarbonate ion as HCO3	400		6.1		mg/L	1		2320B-2011	Total/NA
Total Suspended Solids	54		1.0		mg/L	1		2540 D-2011	Total/NA
Total Dissolved Solids	8400		1000		mg/L	1		2540C-2011	Total/NA
Total Organic Carbon	19		1.0		mg/L	1		9060A	Total/NA
Total Organic Carbon - Quad	19		1.0		mg/L	1		9060A	Total/NA
Dissolved Organic Carbon	18		1.0		mg/L	1		9060	Dissolved

Client Sample ID: PT-02-03122020 — Lab Sample ID: 680-181592-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	410	E	1.0		ug/L	1		8260B	Total/NA
Chlorobenzene	360	E	1.0		ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	2.8		1.0		ug/L	1		8260B	Total/NA
1,2-Dichlorobenzene	2.7		1.0		ug/L	1		8260B	Total/NA
1,4-Dichlorobenzene	4.0		1.0		ug/L	1		8260B	Total/NA
Ethylbenzene	6.6		1.0		ug/L	1		8260B	Total/NA
Toluene	2.1		1.0		ug/L	1		8260B	Total/NA
Xylenes, Total	97		1.0		ug/L	1		8260B	Total/NA
Vinyl chloride	3.7		1.0		ug/L	1		8260B	Total/NA
Benzene - DL	320	H	5.0		ug/L	5		8260B	Total/NA
Chlorobenzene - DL	250	H	5.0		ug/L	5		8260B	Total/NA
Bromide	1.1		0.50		mg/L	1		300.0-1993 R2.1	Total/NA
Fluoride	0.13		0.10		mg/L	1		300.0-1993 R2.1	Total/NA
Sulfate	4.7		1.0		mg/L	1		300.0-1993 R2.1	Total/NA
Chloride - DL	4000		50		mg/L	100		300.0-1993 R2.1	Total/NA
Iron	11000		100		ug/L	1		6020A	Dissolved
Manganese	960		5.0		ug/L	1		6020A	Dissolved

This Detection Summary does not include radiochemical test results.

Client Sample ID: PT-02-03122020 (Continued)

Lab Sample ID: 680-181592-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Zinc	540		20		ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	43000		3.3		mg/L	1		SM 2340B	Total/NA
Calcium hardness as calcium carbonate	42000		1.2		mg/L	1		SM 2340B	Total/NA
Magnesium hardness as calcium carbonate	370		2.1		mg/L	1		SM 2340B	Total/NA
Alkalinity	310		5.0		mg/L	1		2320B-2011	Total/NA
Bicarbonate Alkalinity as CaCO3	310		5.0		mg/L	1		2320B-2011	Total/NA
Carbon Dioxide, Free	58		5.0		mg/L	1		2320B-2011	Total/NA
Bicarbonate ion as HCO3	380		6.1		mg/L	1		2320B-2011	Total/NA
Total Suspended Solids	96		2.0		mg/L	1		2540 D-2011	Total/NA
Total Dissolved Solids	8400		1000		mg/L	1		2540C-2011	Total/NA
Total Organic Carbon	20		1.0		mg/L	1		9060A	Total/NA
Total Organic Carbon - Quad	20		1.0		mg/L	1		9060A	Total/NA
Dissolved Organic Carbon	18		1.0		mg/L	1		9060	Dissolved

Client Sample ID: PT-01-03122020

Lab Sample ID: 680-181592-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	310	E	1.0		ug/L	1		8260B	Total/NA
Chlorobenzene	330	E	1.0		ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	2.2		1.0		ug/L	1		8260B	Total/NA
1,2-Dichlorobenzene	2.9		1.0		ug/L	1		8260B	Total/NA
1,4-Dichlorobenzene	4.0		1.0		ug/L	1		8260B	Total/NA
Ethylbenzene	5.6		1.0		ug/L	1		8260B	Total/NA
Toluene	1.8		1.0		ug/L	1		8260B	Total/NA
Xylenes, Total	25		1.0		ug/L	1		8260B	Total/NA
Vinyl chloride	3.0		1.0		ug/L	1		8260B	Total/NA
Benzene - DL	220	H	5.0		ug/L	5		8260B	Total/NA
Chlorobenzene - DL	210	H	5.0		ug/L	5		8260B	Total/NA
Bromide	1.2		0.50		mg/L	1		300.0-1993 R2.1	Total/NA
Fluoride	0.14		0.10		mg/L	1		300.0-1993 R2.1	Total/NA
Sulfate	5.8		1.0		mg/L	1		300.0-1993 R2.1	Total/NA
Chloride - DL	4100		50		mg/L	100		300.0-1993 R2.1	Total/NA
Iron	6200		100		ug/L	1		6020A	Dissolved
Manganese	940		5.0		ug/L	1		6020A	Dissolved
Zinc	1200		20		ug/L	1		6020A	Dissolved
Hardness as calcium carbonate	5400		3.3		mg/L	1		SM 2340B	Total/NA
Calcium hardness as calcium carbonate	5000		1.2		mg/L	1		SM 2340B	Total/NA
Magnesium hardness as calcium carbonate	380		2.1		mg/L	1		SM 2340B	Total/NA
Alkalinity	300		5.0		mg/L	1		2320B-2011	Total/NA
Bicarbonate Alkalinity as CaCO3	300		5.0		mg/L	1		2320B-2011	Total/NA
Carbon Dioxide, Free	53		5.0		mg/L	1		2320B-2011	Total/NA
Bicarbonate ion as HCO3	360		6.1		mg/L	1		2320B-2011	Total/NA
Total Suspended Solids	72		2.0		mg/L	1		2540 D-2011	Total/NA
Total Dissolved Solids	8400		1000		mg/L	1		2540C-2011	Total/NA
Total Organic Carbon	19		1.0		mg/L	1		9060A	Total/NA
Total Organic Carbon - Quad	19		1.0		mg/L	1		9060A	Total/NA
Dissolved Organic Carbon	17		1.0		mg/L	1		9060	Dissolved

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: 01-PT-03122020 — Lab Sample ID: 680-181592-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	0.23		0.020		mg/L	20		8260B	TCLP
Benzene	0.29		0.020		mg/L	20		8260B	TCLP

Client Sample ID: Trip Blank — Lab Sample ID: 680-181592-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: PT-03-03122020
Date Collected: 03/12/20 20:20
Date Received: 03/14/20 10:25

Lab Sample ID: 680-181592-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			03/25/20 16:37	1
Benzene	**410**	**E**	1.0		ug/L			03/25/20 16:37	1
Carbon disulfide	2.0	U	2.0		ug/L			03/25/20 16:37	1
Chlorobenzene	**310**	**E**	1.0		ug/L			03/25/20 16:37	1
Chloroform	1.0	U	1.0		ug/L			03/25/20 16:37	1
cis-1,2-Dichloroethene	**3.0**		1.0		ug/L			03/25/20 16:37	1
1,2-Dichlorobenzene	**2.0**		1.0		ug/L			03/25/20 16:37	1
1,4-Dichlorobenzene	**2.9**		1.0		ug/L			03/25/20 16:37	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			03/25/20 16:37	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			03/25/20 16:37	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			03/25/20 16:37	1
Ethylbenzene	**5.7**		1.0		ug/L			03/25/20 16:37	1
Methylene Chloride	5.0	U	5.0		ug/L			03/25/20 16:37	1
Methyl ethyl ketone (MEK)	10	U	10		ug/L			03/25/20 16:37	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			03/25/20 16:37	1
p-Cymene	1.0	U	1.0		ug/L			03/25/20 16:37	1
Tetrachloroethene	1.0	U *	1.0		ug/L			03/25/20 16:37	1
Toluene	**2.2**		1.0		ug/L			03/25/20 16:37	1
1,2,4-Trichlorobenzene	5.0	U	5.0		ug/L			03/25/20 16:37	1
Xylenes, Total	**150**		1.0		ug/L			03/25/20 16:37	1
Vinyl chloride	**3.2**		1.0		ug/L			03/25/20 16:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*80 - 120*		*03/25/20 16:37*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*03/25/20 16:37*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 122*		*03/25/20 16:37*	*1*
4-Bromofluorobenzene (Surr)	*83*		*80 - 120*		*03/25/20 16:37*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**290**	**H**	5.0		ug/L			04/10/20 18:50	5
Chlorobenzene	**200**	**H**	5.0		ug/L			04/10/20 18:50	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 120*		*04/10/20 18:50*	*5*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*04/10/20 18:50*	*5*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*04/10/20 18:50*	*5*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*04/10/20 18:50*	*5*

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
alpha-BHC	0.050	U	0.050		ug/L		03/19/20 18:02	03/25/20 21:17	1
delta-BHC	0.050	U	0.050		ug/L		03/19/20 18:02	03/25/20 21:17	1
gamma-BHC (Lindane)	0.050	U	0.050		ug/L		03/19/20 18:02	03/25/20 21:17	1
Total Toxaphene	5.0	U	5.0		ug/L		03/19/20 18:02	03/25/20 21:17	1
Toxaphene, Technical	5.0	U	5.0		ug/L		03/19/20 18:02	03/25/20 21:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*34*		*10 - 130*	*03/19/20 18:02*	*03/25/20 21:17*	*1*
Tetrachloro-m-xylene	*82*	*p*	*39 - 130*	*03/19/20 18:02*	*03/25/20 21:17*	*1*

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: PT-03-03122020

Date Collected: 03/12/20 20:20
Date Received: 03/14/20 10:25

Lab Sample ID: 680-181592-1

Matrix: Water

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	0.50	U	0.50		mg/L			03/21/20 17:50	1
Nitrate as N	0.050	U H	0.050		mg/L			03/18/20 03:43	1
Nitrite as N	0.050	U H	0.050		mg/L			03/18/20 03:43	1
Fluoride	**0.14**		0.10		mg/L			03/21/20 17:50	1
Sulfate	**3.8**		1.0		mg/L			03/21/20 17:50	1

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4100**		50		mg/L			03/24/20 19:16	100

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	100	U	100		ug/L		03/19/20 09:59	03/20/20 01:54	1
Arsenic	3.0	U	3.0		ug/L		03/19/20 09:59	03/20/20 01:54	1
Chromium	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 01:54	1
Copper	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 01:54	1
Iron	**12000**		100		ug/L		03/19/20 09:59	03/20/20 01:54	1
Manganese	**990**		5.0		ug/L		03/19/20 09:59	03/20/20 01:54	1
Zinc	**450**		20		ug/L		03/19/20 09:59	03/20/20 01:54	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**5400**		3.3		mg/L			03/25/20 15:35	1
Calcium hardness as calcium carbonate	**5000**		1.2		mg/L			03/25/20 15:35	1
Magnesium hardness as calcium carbonate	**360**		2.1		mg/L			03/25/20 15:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**330**		5.0		mg/L			03/25/20 20:07	1
Bicarbonate Alkalinity as CaCO3	**330**		5.0		mg/L			03/25/20 20:07	1
Carbonate Alkalinity as CaCO3	5.0	U	5.0		mg/L			03/25/20 20:07	1
Hydroxide Alkalinity	5.0	U	5.0		mg/L			03/25/20 20:07	1
Carbon Dioxide, Free	**66**		5.0		mg/L			03/25/20 20:07	1
Phenolphthalein Alkalinity	5.0	U	5.0		mg/L			03/25/20 20:07	1
Bicarbonate ion as HCO3	**400**		6.1		mg/L			03/25/20 20:07	1
Total Organic Carbon	**19**		1.0		mg/L			03/20/20 03:13	1
Total Organic Carbon - Quad	**19**		1.0		mg/L			03/20/20 03:13	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	**54**		1.0		mg/L			03/18/20 12:01	1
Total Dissolved Solids	**8400**		1000		mg/L			03/18/20 09:32	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	**18**		1.0		mg/L			03/25/20 01:53	1

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: PT-02-03122020
Date Collected: 03/12/20 17:00
Date Received: 03/14/20 10:25

Lab Sample ID: 680-181592-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			03/25/20 17:00	1
Benzene	**410**	**E**	1.0		ug/L			03/25/20 17:00	1
Carbon disulfide	2.0	U	2.0		ug/L			03/25/20 17:00	1
Chlorobenzene	**360**	**E**	1.0		ug/L			03/25/20 17:00	1
Chloroform	1.0	U	1.0		ug/L			03/25/20 17:00	1
cis-1,2-Dichloroethene	**2.8**		1.0		ug/L			03/25/20 17:00	1
1,2-Dichlorobenzene	**2.7**		1.0		ug/L			03/25/20 17:00	1
1,4-Dichlorobenzene	**4.0**		1.0		ug/L			03/25/20 17:00	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			03/25/20 17:00	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			03/25/20 17:00	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			03/25/20 17:00	1
Ethylbenzene	**6.6**		1.0		ug/L			03/25/20 17:00	1
Methylene Chloride	5.0	U	5.0		ug/L			03/25/20 17:00	1
Methyl ethyl ketone (MEK)	10	U	10		ug/L			03/25/20 17:00	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			03/25/20 17:00	1
p-Cymene	1.0	U	1.0		ug/L			03/25/20 17:00	1
Tetrachloroethene	1.0	U *	1.0		ug/L			03/25/20 17:00	1
Toluene	**2.1**		1.0		ug/L			03/25/20 17:00	1
1,2,4-Trichlorobenzene	5.0	U	5.0		ug/L			03/25/20 17:00	1
Xylenes, Total	**97**		1.0		ug/L			03/25/20 17:00	1
Vinyl chloride	**3.7**		1.0		ug/L			03/25/20 17:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*03/25/20 17:00*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*03/25/20 17:00*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 122*		*03/25/20 17:00*	*1*
4-Bromofluorobenzene (Surr)	*82*		*80 - 120*		*03/25/20 17:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**320**	**H**	5.0		ug/L			04/10/20 19:13	5
Chlorobenzene	**250**	**H**	5.0		ug/L			04/10/20 19:13	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*80 - 120*		*04/10/20 19:13*	*5*
1,2-Dichloroethane-d4 (Surr)	*97*		*73 - 131*		*04/10/20 19:13*	*5*
Dibromofluoromethane (Surr)	*98*		*80 - 122*		*04/10/20 19:13*	*5*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*04/10/20 19:13*	*5*

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
alpha-BHC	0.048	U	0.048		ug/L		03/19/20 18:02	03/25/20 21:32	1
delta-BHC	0.048	U	0.048		ug/L		03/19/20 18:02	03/25/20 21:32	1
gamma-BHC (Lindane)	0.048	U	0.048		ug/L		03/19/20 18:02	03/25/20 21:32	1
Total Toxaphene	4.8	U	4.8		ug/L		03/19/20 18:02	03/25/20 21:32	1
Toxaphene, Technical	4.8	U	4.8		ug/L		03/19/20 18:02	03/25/20 21:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*28*	*p*	*10 - 130*	*03/19/20 18:02*	*03/25/20 21:32*	*1*
Tetrachloro-m-xylene	*99*	*p*	*39 - 130*	*03/19/20 18:02*	*03/25/20 21:32*	*1*

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: PT-02-03122020

Date Collected: 03/12/20 17:00
Date Received: 03/14/20 10:25

Lab Sample ID: 680-181592-2

Matrix: Water

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	**1.1**		0.50		mg/L			03/21/20 18:03	1
Nitrate as N	0.050	U H	0.050		mg/L			03/18/20 03:58	1
Nitrite as N	0.050	U H	0.050		mg/L			03/18/20 03:58	1
Fluoride	**0.13**		0.10		mg/L			03/21/20 18:03	1
Sulfate	**4.7**		1.0		mg/L			03/21/20 18:03	1

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4000**		50		mg/L			03/24/20 19:29	100

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	100	U	100		ug/L		03/19/20 09:59	03/20/20 01:32	1
Arsenic	3.0	U	3.0		ug/L		03/19/20 09:59	03/20/20 01:32	1
Chromium	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 01:32	1
Copper	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 01:32	1
Iron	**11000**		100		ug/L		03/19/20 09:59	03/20/20 01:32	1
Manganese	**960**		5.0		ug/L		03/19/20 09:59	03/20/20 01:32	1
Zinc	**540**		20		ug/L		03/19/20 09:59	03/20/20 01:32	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**43000**		3.3		mg/L			03/25/20 15:35	1
Calcium hardness as calcium carbonate	**42000**		1.2		mg/L			03/25/20 15:35	1
Magnesium hardness as calcium carbonate	**370**		2.1		mg/L			03/25/20 15:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**310**		5.0		mg/L			03/25/20 20:15	1
Bicarbonate Alkalinity as CaCO3	**310**		5.0		mg/L			03/25/20 20:15	1
Carbonate Alkalinity as CaCO3	5.0	U	5.0		mg/L			03/25/20 20:15	1
Hydroxide Alkalinity	5.0	U	5.0		mg/L			03/25/20 20:15	1
Carbon Dioxide, Free	**58**		5.0		mg/L			03/25/20 20:15	1
Phenolphthalein Alkalinity	5.0	U	5.0		mg/L			03/25/20 20:15	1
Bicarbonate ion as HCO3	**380**		6.1		mg/L			03/25/20 20:15	1
Total Organic Carbon	**20**		1.0		mg/L			03/20/20 03:31	1
Total Organic Carbon - Quad	**20**		1.0		mg/L			03/20/20 03:31	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	**96**		2.0		mg/L			03/18/20 12:01	1
Total Dissolved Solids	**8400**		1000		mg/L			03/18/20 09:32	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	**18**		1.0		mg/L			03/25/20 02:44	1

Client Sample ID: PT-01-03122020

Date Collected: 03/12/20 15:00
Date Received: 03/14/20 10:25

Lab Sample ID: 680-181592-3

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			03/25/20 17:23	1
Benzene	**310**	**E**	1.0		ug/L			03/25/20 17:23	1
Carbon disulfide	2.0	U	2.0		ug/L			03/25/20 17:23	1
Chlorobenzene	**330**	**E**	1.0		ug/L			03/25/20 17:23	1
Chloroform	1.0	U	1.0		ug/L			03/25/20 17:23	1
cis-1,2-Dichloroethene	**2.2**		1.0		ug/L			03/25/20 17:23	1
1,2-Dichlorobenzene	**2.9**		1.0		ug/L			03/25/20 17:23	1
1,4-Dichlorobenzene	**4.0**		1.0		ug/L			03/25/20 17:23	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			03/25/20 17:23	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			03/25/20 17:23	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			03/25/20 17:23	1
Ethylbenzene	**5.6**		1.0		ug/L			03/25/20 17:23	1
Methylene Chloride	5.0	U	5.0		ug/L			03/25/20 17:23	1
Methyl ethyl ketone (MEK)	10	U	10		ug/L			03/25/20 17:23	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			03/25/20 17:23	1
p-Cymene	1.0	U	1.0		ug/L			03/25/20 17:23	1
Tetrachloroethene	1.0	U *	1.0		ug/L			03/25/20 17:23	1
Toluene	**1.8**		1.0		ug/L			03/25/20 17:23	1
1,2,4-Trichlorobenzene	5.0	U	5.0		ug/L			03/25/20 17:23	1
Xylenes, Total	**25**		1.0		ug/L			03/25/20 17:23	1
Vinyl chloride	**3.0**		1.0		ug/L			03/25/20 17:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*03/25/20 17:23*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*		*03/25/20 17:23*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 122*		*03/25/20 17:23*	*1*
4-Bromofluorobenzene (Surr)	*83*		*80 - 120*		*03/25/20 17:23*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**220**	**H**	5.0		ug/L			04/10/20 19:37	5
Chlorobenzene	**210**	**H**	5.0		ug/L			04/10/20 19:37	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/10/20 19:37*	*5*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*04/10/20 19:37*	*5*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*04/10/20 19:37*	*5*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*04/10/20 19:37*	*5*

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
alpha-BHC	0.049	U	0.049		ug/L		03/19/20 18:02	03/25/20 21:47	1
delta-BHC	0.049	U	0.049		ug/L		03/19/20 18:02	03/25/20 21:47	1
gamma-BHC (Lindane)	0.049	U	0.049		ug/L		03/19/20 18:02	03/25/20 21:47	1
Total Toxaphene	4.9	U	4.9		ug/L		03/19/20 18:02	03/25/20 21:47	1
Toxaphene, Technical	4.9	U	4.9		ug/L		03/19/20 18:02	03/25/20 21:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*26*		*10 - 130*	*03/19/20 18:02*	*03/25/20 21:47*	*1*
Tetrachloro-m-xylene	*71*	*p*	*39 - 130*	*03/19/20 18:02*	*03/25/20 21:47*	*1*

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: PT-01-03122020

Date Collected: 03/12/20 15:00
Date Received: 03/14/20 10:25

Lab Sample ID: 680-181592-3

Matrix: Water

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	**1.2**		0.50		mg/L			03/21/20 18:16	1
Nitrate as N	0.050	U H	0.050		mg/L			03/18/20 04:12	1
Nitrite as N	0.050	U H	0.050		mg/L			03/18/20 04:12	1
Fluoride	**0.14**		0.10		mg/L			03/21/20 18:16	1
Sulfate	**5.8**		1.0		mg/L			03/21/20 18:16	1

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4100**		50		mg/L			03/24/20 19:41	100

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	100	U	100		ug/L		03/19/20 09:59	03/20/20 01:43	1
Arsenic	3.0	U	3.0		ug/L		03/19/20 09:59	03/20/20 01:43	1
Chromium	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 01:43	1
Copper	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 01:43	1
Iron	**6200**		100		ug/L		03/19/20 09:59	03/20/20 01:43	1
Manganese	**940**		5.0		ug/L		03/19/20 09:59	03/20/20 01:43	1
Zinc	**1200**		20		ug/L		03/19/20 09:59	03/20/20 01:43	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	**5400**		3.3		mg/L			03/25/20 15:35	1
Calcium hardness as calcium carbonate	**5000**		1.2		mg/L			03/25/20 15:35	1
Magnesium hardness as calcium carbonate	**380**		2.1		mg/L			03/25/20 15:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**300**		5.0		mg/L			03/25/20 20:23	1
Bicarbonate Alkalinity as CaCO3	**300**		5.0		mg/L			03/25/20 20:23	1
Carbonate Alkalinity as CaCO3	5.0	U	5.0		mg/L			03/25/20 20:23	1
Hydroxide Alkalinity	5.0	U	5.0		mg/L			03/25/20 20:23	1
Carbon Dioxide, Free	**53**		5.0		mg/L			03/25/20 20:23	1
Phenolphthalein Alkalinity	5.0	U	5.0		mg/L			03/25/20 20:23	1
Bicarbonate ion as HCO3	**360**		6.1		mg/L			03/25/20 20:23	1
Total Organic Carbon	**19**		1.0		mg/L			03/20/20 03:48	1
Total Organic Carbon - Quad	**19**		1.0		mg/L			03/20/20 03:48	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	**72**		2.0		mg/L			03/18/20 12:01	1
Total Dissolved Solids	**8400**		1000		mg/L			03/18/20 09:32	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	**17**		1.0		mg/L			03/25/20 03:01	1

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: 01-PT-03122020
Date Collected: 03/12/20 17:00
Date Received: 03/14/20 10:25

Lab Sample ID: 680-181592-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	0.020	U	0.020		mg/L			03/27/20 16:35	20
Chlorobenzene	**0.23**		0.020		mg/L			03/27/20 16:35	20
Tetrachloroethene	0.020	U	0.020		mg/L			03/27/20 16:35	20
Carbon tetrachloride	0.020	U	0.020		mg/L			03/27/20 16:35	20
Chloroform	0.020	U	0.020		mg/L			03/27/20 16:35	20
Benzene	**0.29**		0.020		mg/L			03/27/20 16:35	20
Vinyl chloride	0.020	U	0.020		mg/L			03/27/20 16:35	20
1,1-Dichloroethene	0.020	U	0.020		mg/L			03/27/20 16:35	20
2-Butanone (MEK)	0.20	U	0.20		mg/L			03/27/20 16:35	20
Trichloroethene	0.020	U	0.020		mg/L			03/27/20 16:35	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/27/20 16:35*	*20*
1,2-Dichloroethane-d4 (Surr)	*99*		*73 - 131*		*03/27/20 16:35*	*20*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*03/27/20 16:35*	*20*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*03/27/20 16:35*	*20*

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/07/20 21:33	1
Chlordane (technical)	0.012	U	0.012		mg/L		03/30/20 14:48	04/07/20 21:33	1
gamma-BHC (Lindane)	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/07/20 21:33	1
Endrin	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/07/20 21:33	1
Methoxychlor	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/07/20 21:33	1
Heptachlor	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/07/20 21:33	1
Toxaphene	0.12	U	0.12		mg/L		03/30/20 14:48	04/07/20 21:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*73*		*40 - 130*	*03/30/20 14:48*	*04/07/20 21:33*	*1*
DCB Decachlorobiphenyl	*44*		*14 - 130*	*03/30/20 14:48*	*04/07/20 21:33*	*1*

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: Trip Blank
Date Collected: 03/12/20 00:00
Date Received: 03/14/20 10:25

Lab Sample ID: 680-181592-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			03/25/20 11:09	1
Benzene	1.0	U	1.0		ug/L			03/25/20 11:09	1
Carbon disulfide	2.0	U	2.0		ug/L			03/25/20 11:09	1
Chlorobenzene	1.0	U	1.0		ug/L			03/25/20 11:09	1
Chloroform	1.0	U	1.0		ug/L			03/25/20 11:09	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			03/25/20 11:09	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			03/25/20 11:09	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			03/25/20 11:09	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			03/25/20 11:09	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			03/25/20 11:09	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			03/25/20 11:09	1
Ethylbenzene	1.0	U	1.0		ug/L			03/25/20 11:09	1
Methylene Chloride	5.0	U	5.0		ug/L			03/25/20 11:09	1
Methyl ethyl ketone (MEK)	10	U	10		ug/L			03/25/20 11:09	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			03/25/20 11:09	1
p-Cymene	1.0	U	1.0		ug/L			03/25/20 11:09	1
Tetrachloroethene	1.0	U *	1.0		ug/L			03/25/20 11:09	1
Toluene	1.0	U	1.0		ug/L			03/25/20 11:09	1
1,2,4-Trichlorobenzene	5.0	U	5.0		ug/L			03/25/20 11:09	1
Xylenes, Total	1.0	U	1.0		ug/L			03/25/20 11:09	1
Vinyl chloride	1.0	U	1.0		ug/L			03/25/20 11:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*80 - 120*		*03/25/20 11:09*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*03/25/20 11:09*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*03/25/20 11:09*	*1*
4-Bromofluorobenzene (Surr)	*83*		*80 - 120*		*03/25/20 11:09*	*1*

Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	DBFM	BFB
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)
680-181592-1	PT-03-03122020	100	95	104	83
680-181592-1 - DL	PT-03-03122020	106	93	99	104
680-181592-2	PT-02-03122020	99	94	103	82
680-181592-2 - DL	PT-02-03122020	103	97	98	102
680-181592-3	PT-01-03122020	99	93	104	83
680-181592-3 - DL	PT-01-03122020	104	95	99	103
680-181592-5	Trip Blank	100	95	105	83
LCS 680-612405/4	Lab Control Sample	104	95	108	93
LCS 680-612806/3	Lab Control Sample	103	106	106	98
LCS 680-614683/4	Lab Control Sample	102	94	100	94
LCSD 680-612405/5	Lab Control Sample Dup	104	93	108	92
LCSD 680-612806/4	Lab Control Sample Dup	101	105	105	99
LCSD 680-614683/5	Lab Control Sample Dup	102	91	96	95
MB 680-612405/10	Method Blank	99	95	104	82
MB 680-612806/9	Method Blank	107	104	101	100
MB 680-614683/10	Method Blank	105	88	96	98

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: TCLP

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	DBFM	BFB
Lab Sample ID	Client Sample ID	(80-120)	(73-131)	(80-122)	(80-120)
680-181592-4	01-PT-03122020	108	99	101	110
LB 680-612631/1-A	Method Blank	105	106	102	102

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
		DCBP1	TCX1
Lab Sample ID	Client Sample ID	(10-130)	(39-130)
680-181592-1	PT-03-03122020	34	82 p
680-181592-2	PT-02-03122020	28 p	99 p

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Surrogate Summary

Client: Geosyntec Consultants, Inc. Job ID: 680-181592-1
Project/Site: Ashland - Brunswick

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCBP2	TCX1								
Lab Sample ID	Client Sample ID	(10-130)	(39-130)								
680-181592-3	PT-01-03122020	26	71 p								

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCBP2	TCX2								
Lab Sample ID	Client Sample ID	(10-130)	(39-130)								
LCS 680-611711/24-A	Lab Control Sample	47	74								
LCSD 680-611711/25-A	Lab Control Sample Dup	35	77								

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		TCX1	DCBP1								
Lab Sample ID	Client Sample ID	(40-130)	(14-130)								
LCS 680-613231/21-A	Lab Control Sample	76	29								
MB 680-613231/20-A	Method Blank	81	57								

Surrogate Legend

TCX = Tetrachloro-m-xylene
DCBP = DCB Decachlorobiphenyl

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCBP1	TCX2								
Lab Sample ID	Client Sample ID	(10-130)	(39-130)								
MB 680-611711/18-A	Method Blank	79	82								

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Surrogate Summary

Client: Geosyntec Consultants, Inc. Job ID: 680-181592-1
Project/Site: Ashland - Brunswick

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		TCX2	DCBP1								
Lab Sample ID	Client Sample ID	(40-130)	(14-130)								
680-181592-4	01-PT-03122020	73	44								

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		TCX1	DCBP1								
Lab Sample ID	Client Sample ID	(40-130)	(14-130)								
LB 680-612479/1-E	Method Blank	91	78								
LB 680-612482/1-D	Method Blank	81	66								

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-612405/10
Matrix: Water
Analysis Batch: 612405

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			03/25/20 10:45	1
Benzene	1.0	U	1.0		ug/L			03/25/20 10:45	1
Carbon disulfide	2.0	U	2.0		ug/L			03/25/20 10:45	1
Chlorobenzene	1.0	U	1.0		ug/L			03/25/20 10:45	1
Chloroform	1.0	U	1.0		ug/L			03/25/20 10:45	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			03/25/20 10:45	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			03/25/20 10:45	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			03/25/20 10:45	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			03/25/20 10:45	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			03/25/20 10:45	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			03/25/20 10:45	1
Ethylbenzene	1.0	U	1.0		ug/L			03/25/20 10:45	1
Methylene Chloride	5.0	U	5.0		ug/L			03/25/20 10:45	1
Methyl ethyl ketone (MEK)	10	U	10		ug/L			03/25/20 10:45	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			03/25/20 10:45	1
p-Cymene	1.0	U	1.0		ug/L			03/25/20 10:45	1
Tetrachloroethene	1.0	U	1.0		ug/L			03/25/20 10:45	1
Toluene	1.0	U	1.0		ug/L			03/25/20 10:45	1
1,2,4-Trichlorobenzene	5.0	U	5.0		ug/L			03/25/20 10:45	1
Xylenes, Total	1.0	U	1.0		ug/L			03/25/20 10:45	1
Vinyl chloride	1.0	U	1.0		ug/L			03/25/20 10:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*80 - 120*		*03/ 25/20 10:45*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*03/25/20 10:45*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 122*		*03/25/20 10:45*	*1*
4-Bromofluorobenzene (Surr)	*82*		*80 - 120*		*03/25/20 10:45*	*1*

Lab Sample ID: LCS 680-612405/4
Matrix: Water
Analysis Batch: 612405

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	224		ug/L		89	70 - 135
Benzene	50.0	52.4		ug/L		105	80 - 120
Carbon disulfide	50.0	52.4		ug/L		105	80 - 120
Chlorobenzene	50.0	58.6		ug/L		117	80 - 120
Chloroform	50.0	49.6		ug/L		99	80 - 120
cis-1,2-Dichloroethene	50.0	49.6		ug/L		99	80 - 120
1,2-Dichlorobenzene	50.0	54.1		ug/L		108	80 - 120
1,4-Dichlorobenzene	50.0	53.6		ug/L		107	80 - 120
1,1-Dichloroethane	50.0	49.2		ug/L		98	80 - 120
1,1-Dichloroethene	50.0	53.2		ug/L		106	76 - 120
1,2-Dichloropropane	50.0	48.6		ug/L		97	80 - 120
Ethylbenzene	50.0	57.9		ug/L		116	80 - 120
Methylene Chloride	50.0	49.7		ug/L		99	80 - 120
Methyl ethyl ketone (MEK)	250	239		ug/L		96	80 - 131
4-Methyl-2-pentanone (MIBK)	250	221		ug/L		89	76 - 124

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-612405/4
Matrix: Water
Analysis Batch: 612405

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
p-Cymene	50.0	55.6		ug/L		111	80 - 120
Tetrachloroethene	50.0	64.4	*	ug/L		129	80 - 121
Toluene	50.0	54.5		ug/L		109	80 - 113
1,2,4-Trichlorobenzene	50.0	60.2		ug/L		120	68 - 128
Xylenes, Total	100	116		ug/L		116	80 - 120
Vinyl chloride	50.0	46.6		ug/L		93	71 - 128

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*
Dibromofluoromethane (Surr)	*108*		*80 - 122*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*

Lab Sample ID: LCSD 680-612405/5
Matrix: Water
Analysis Batch: 612405

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	222		ug/L		89	70 - 135	1	30
Benzene	50.0	52.4		ug/L		105	80 - 120	0	20
Carbon disulfide	50.0	53.5		ug/L		107	80 - 120	2	20
Chlorobenzene	50.0	58.7		ug/L		117	80 - 120	0	20
Chloroform	50.0	49.6		ug/L		99	80 - 120	0	20
cis-1,2-Dichloroethene	50.0	48.9		ug/L		98	80 - 120	1	20
1,2-Dichlorobenzene	50.0	53.4		ug/L		107	80 - 120	1	20
1,4-Dichlorobenzene	50.0	53.4		ug/L		107	80 - 120	0	20
1,1-Dichloroethane	50.0	48.9		ug/L		98	80 - 120	0	20
1,1-Dichloroethene	50.0	54.5		ug/L		109	76 - 120	2	20
1,2-Dichloropropane	50.0	48.1		ug/L		96	80 - 120	1	20
Ethylbenzene	50.0	58.3		ug/L		117	80 - 120	1	20
Methylene Chloride	50.0	49.4		ug/L		99	80 - 120	1	20
Methyl ethyl ketone (MEK)	250	236		ug/L		94	80 - 131	1	20
4-Methyl-2-pentanone (MIBK)	250	218		ug/L		87	76 - 124	2	20
p-Cymene	50.0	56.8		ug/L		114	80 - 120	2	20
Tetrachloroethene	50.0	65.7	*	ug/L		131	80 - 121	2	20
Toluene	50.0	54.9		ug/L		110	80 - 113	1	20
1,2,4-Trichlorobenzene	50.0	61.0		ug/L		122	68 - 128	1	20
Xylenes, Total	100	116		ug/L		116	80 - 120	0	20
Vinyl chloride	50.0	47.6		ug/L		95	71 - 128	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*104*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*93*		*73 - 131*
Dibromofluoromethane (Surr)	*108*		*80 - 122*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 680-612806/9
Matrix: Water
Analysis Batch: 612806

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	0.0010	U	0.0010		mg/L			03/27/20 10:23	1
Carbon tetrachloride	0.0010	U	0.0010		mg/L			03/27/20 10:23	1
Benzene	0.0010	U	0.0010		mg/L			03/27/20 10:23	1
Chlorobenzene	0.0010	U	0.0010		mg/L			03/27/20 10:23	1
Chloroform	0.0010	U	0.0010		mg/L			03/27/20 10:23	1
Trichloroethene	0.0010	U	0.0010		mg/L			03/27/20 10:23	1
1,1-Dichloroethene	0.0010	U	0.0010		mg/L			03/27/20 10:23	1
2-Butanone (MEK)	0.010	U	0.010		mg/L			03/27/20 10:23	1
Tetrachloroethene	0.0010	U	0.0010		mg/L			03/27/20 10:23	1
Vinyl chloride	0.0010	U	0.0010		mg/L			03/27/20 10:23	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*107*		*80 - 120*		*03/ 27/20 10:23*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*73 - 131*		*03/27/20 10:23*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 122*		*03/27/20 10:23*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/27/20 10:23*	*1*

Lab Sample ID: LCS 680-612806/3
Matrix: Water
Analysis Batch: 612806

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dichloroethane	0.0500	0.0541		mg/L		108	72 - 128
Carbon tetrachloride	0.0500	0.0535		mg/L		107	67 - 125
Benzene	0.0500	0.0525		mg/L		105	80 - 120
Chlorobenzene	0.0500	0.0480		mg/L		96	80 - 120
Chloroform	0.0500	0.0524		mg/L		105	80 - 120
Trichloroethene	0.0500	0.0525		mg/L		105	80 - 120
1,1-Dichloroethene	0.0500	0.0536		mg/L		107	80 - 120
2-Butanone (MEK)	0.250	0.267		mg/L		107	79 - 125
Tetrachloroethene	0.0500	0.0514		mg/L		103	71 - 123
Vinyl chloride	0.0501	0.0540		mg/L		108	80 - 129

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*103*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*106*		*73 - 131*
Dibromofluoromethane (Surr)	*106*		*80 - 122*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*

Lab Sample ID: LCSD 680-612806/4
Matrix: Water
Analysis Batch: 612806

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloroethane	0.0500	0.0529		mg/L		106	72 - 128	2	50
Carbon tetrachloride	0.0500	0.0528		mg/L		106	67 - 125	1	20
Benzene	0.0500	0.0521		mg/L		104	80 - 120	1	20
Chlorobenzene	0.0500	0.0479		mg/L		96	80 - 120	0	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-612806/4
Matrix: Water
Analysis Batch: 612806

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloroform			0.0500	0.0516		mg/L		103	80 - 120	2	20
Trichloroethene			0.0500	0.0512		mg/L		102	80 - 120	2	20
1,1-Dichloroethene			0.0500	0.0532		mg/L		106	80 - 120	1	20
2-Butanone (MEK)			0.250	0.264		mg/L		106	79 - 125	1	20
Tetrachloroethene			0.0500	0.0512		mg/L		102	71 - 123	0	20
Vinyl chloride			0.0501	0.0537		mg/L		107	80 - 129	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*105*		*73 - 131*
Dibromofluoromethane (Surr)	*105*		*80 - 122*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*

Lab Sample ID: MB 680-614683/10
Matrix: Water
Analysis Batch: 614683

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10		ug/L			04/10/20 14:33	1
Benzene	1.0	U	1.0		ug/L			04/10/20 14:33	1
Carbon disulfide	2.0	U	2.0		ug/L			04/10/20 14:33	1
Chlorobenzene	1.0	U	1.0		ug/L			04/10/20 14:33	1
Chloroform	1.0	U	1.0		ug/L			04/10/20 14:33	1
cis-1,2-Dichloroethene	1.0	U	1.0		ug/L			04/10/20 14:33	1
1,2-Dichlorobenzene	1.0	U	1.0		ug/L			04/10/20 14:33	1
1,4-Dichlorobenzene	1.0	U	1.0		ug/L			04/10/20 14:33	1
1,1-Dichloroethane	1.0	U	1.0		ug/L			04/10/20 14:33	1
1,1-Dichloroethene	1.0	U	1.0		ug/L			04/10/20 14:33	1
1,2-Dichloropropane	1.0	U	1.0		ug/L			04/10/20 14:33	1
Ethylbenzene	1.0	U	1.0		ug/L			04/10/20 14:33	1
Methylene Chloride	5.0	U	5.0		ug/L			04/10/20 14:33	1
Methyl ethyl ketone (MEK)	10	U	10		ug/L			04/10/20 14:33	1
4-Methyl-2-pentanone (MIBK)	10	U	10		ug/L			04/10/20 14:33	1
p-Cymene	1.0	U	1.0		ug/L			04/10/20 14:33	1
Tetrachloroethene	1.0	U	1.0		ug/L			04/10/20 14:33	1
Toluene	1.0	U	1.0		ug/L			04/10/20 14:33	1
1,2,4-Trichlorobenzene	5.0	U	5.0		ug/L			04/10/20 14:33	1
Xylenes, Total	1.0	U	1.0		ug/L			04/10/20 14:33	1
Vinyl chloride	1.0	U	1.0		ug/L			04/10/20 14:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/10/20 14:33*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*73 - 131*		*04/10/20 14:33*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 122*		*04/10/20 14:33*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*04/10/20 14:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 680-614683/4
Matrix: Water
Analysis Batch: 614683

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	250	299		ug/L		120	70 - 135
Benzene	50.0	50.8		ug/L		102	80 - 120
Carbon disulfide	50.0	50.7		ug/L		101	80 - 120
Chlorobenzene	50.0	48.6		ug/L		97	80 - 120
Chloroform	50.0	48.6		ug/L		97	80 - 120
cis-1,2-Dichloroethene	50.0	51.5		ug/L		103	80 - 120
1,2-Dichlorobenzene	50.0	48.0		ug/L		96	80 - 120
1,4-Dichlorobenzene	50.0	46.3		ug/L		93	80 - 120
1,1-Dichloroethane	50.0	48.6		ug/L		97	80 - 120
1,1-Dichloroethene	50.0	51.7		ug/L		103	76 - 120
1,2-Dichloropropane	50.0	51.9		ug/L		104	80 - 120
Ethylbenzene	50.0	50.8		ug/L		102	80 - 120
Methylene Chloride	50.0	46.3		ug/L		93	80 - 120
Methyl ethyl ketone (MEK)	250	274		ug/L		110	80 - 131
4-Methyl-2-pentanone (MIBK)	250	266		ug/L		106	76 - 124
p-Cymene	50.0	49.1		ug/L		98	80 - 120
Tetrachloroethene	50.0	50.6		ug/L		101	80 - 121
Toluene	50.0	50.6		ug/L		101	80 - 113
1,2,4-Trichlorobenzene	50.0	50.6		ug/L		101	68 - 128
Xylenes, Total	100	101		ug/L		101	80 - 120
Vinyl chloride	50.1	52.8		ug/L		105	71 - 128

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*
Dibromofluoromethane (Surr)	*100*		*80 - 122*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*

Lab Sample ID: LCSD 680-614683/5
Matrix: Water
Analysis Batch: 614683

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	250	280		ug/L		112	70 - 135	7	30
Benzene	50.0	50.5		ug/L		101	80 - 120	1	20
Carbon disulfide	50.0	51.0		ug/L		102	80 - 120	1	20
Chlorobenzene	50.0	48.9		ug/L		98	80 - 120	1	20
Chloroform	50.0	48.1		ug/L		96	80 - 120	1	20
cis-1,2-Dichloroethene	50.0	50.3		ug/L		101	80 - 120	2	20
1,2-Dichlorobenzene	50.0	47.8		ug/L		96	80 - 120	0	20
1,4-Dichlorobenzene	50.0	47.2		ug/L		94	80 - 120	2	20
1,1-Dichloroethane	50.0	48.8		ug/L		98	80 - 120	1	20
1,1-Dichloroethene	50.0	52.5		ug/L		105	76 - 120	2	20
1,2-Dichloropropane	50.0	50.0		ug/L		100	80 - 120	4	20
Ethylbenzene	50.0	50.5		ug/L		101	80 - 120	1	20
Methylene Chloride	50.0	45.2		ug/L		90	80 - 120	2	20
Methyl ethyl ketone (MEK)	250	258		ug/L		103	80 - 131	6	20
4-Methyl-2-pentanone (MIBK)	250	254		ug/L		101	76 - 124	5	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-614683/5
Matrix: Water
Analysis Batch: 614683

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
p-Cymene			50.0	50.5		ug/L		101	80 - 120	3	20
Tetrachloroethene			50.0	50.4		ug/L		101	80 - 121	0	20
Toluene			50.0	49.8		ug/L		100	80 - 113	2	20
1,2,4-Trichlorobenzene			50.0	50.5		ug/L		101	68 - 128	0	20
Xylenes, Total			100	100		ug/L		100	80 - 120	1	20
Vinyl chloride			50.1	52.6		ug/L		105	71 - 128	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*91*		*73 - 131*
Dibromofluoromethane (Surr)	*96*		*80 - 122*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*

Lab Sample ID: LB 680-612631/1-A
Matrix: Water
Analysis Batch: 612806

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	0.020	U	0.020		mg/L			03/27/20 16:11	20
Carbon tetrachloride	0.020	U	0.020		mg/L			03/27/20 16:11	20
Benzene	0.020	U	0.020		mg/L			03/27/20 16:11	20
Chlorobenzene	0.020	U	0.020		mg/L			03/27/20 16:11	20
Chloroform	0.020	U	0.020		mg/L			03/27/20 16:11	20
Trichloroethene	0.020	U	0.020		mg/L			03/27/20 16:11	20
1,1-Dichloroethene	0.020	U	0.020		mg/L			03/27/20 16:11	20
2-Butanone (MEK)	0.20	U	0.20		mg/L			03/27/20 16:11	20
Tetrachloroethene	0.020	U	0.020		mg/L			03/27/20 16:11	20
Vinyl chloride	0.020	U	0.020		mg/L			03/27/20 16:11	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*03/ 27/20 16:11*	*20*
1,2-Dichloroethane-d4 (Surr)	*106*		*73 - 131*		*03/27/20 16:11*	*20*
Dibromofluoromethane (Surr)	*102*		*80 - 122*		*03/27/20 16:11*	*20*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*03/27/20 16:11*	*20*

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Lab Sample ID: MB 680-611711/18-A
Matrix: Water
Analysis Batch: 612510

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 611711

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
alpha-BHC	0.013	U	0.013		ug/L		03/19/20 18:02	03/25/20 18:33	1
delta-BHC	0.013	U	0.013		ug/L		03/19/20 18:02	03/25/20 18:33	1
gamma-BHC (Lindane)	0.013	U	0.013		ug/L		03/19/20 18:02	03/25/20 18:33	1
Total Toxaphene	1.3	U	1.3		ug/L		03/19/20 18:02	03/25/20 18:33	1
Toxaphene, Technical	1.3	U	1.3		ug/L		03/19/20 18:02	03/25/20 18:33	1

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography (Continued)

Lab Sample ID: MB 680-611711/18-A
Matrix: Water
Analysis Batch: 612510

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 611711

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	82		39 - 130	03/19/20 18:02	03/25/20 18:33	1
DCBDecachlorobiphenyl	79		10 - 130	03/19/20 18:02	03/25/20 18:33	1

Lab Sample ID: LCS 680-611711/19-A
Matrix: Water
Analysis Batch: 612510

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 611711

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
alpha-BHC			0.0250	0.0274		ug/L		110	45 - 130		
delta-BHC			0.0250	0.0260		ug/L		104	47 - 140		
gamma-BHC (Lindane)			0.0250	0.0267		ug/L		107	47 - 130		

Lab Sample ID: LCS 680-611711/24-A
Matrix: Water
Analysis Batch: 612510

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 611711

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tetrachloro-m-xylene	74		39 - 130
DCBDecachlorobiphenyl	47		10 - 130

Lab Sample ID: LCSD 680-611711/20-A
Matrix: Water
Analysis Batch: 612510

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 611711

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
alpha-BHC			0.0250	0.0244		ug/L		97	45 - 130	12	30
delta-BHC			0.0250	0.0261		ug/L		105	47 - 140	1	30
gamma-BHC (Lindane)			0.0250	0.0251		ug/L		100	47 - 130	6	30

Lab Sample ID: LCSD 680-611711/25-A
Matrix: Water
Analysis Batch: 612510

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 611711

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tetrachloro-m-xylene	77		39 - 130
DCBDecachlorobiphenyl	35		10 - 130

Lab Sample ID: MB 680-613231/20-A
Matrix: Water
Analysis Batch: 613591

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613231

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	0.000025	U	0.000025		mg/L		03/30/20 14:48	04/01/20 19:33	1
Chlordane (technical)	0.00025	U	0.00025		mg/L		03/30/20 14:48	04/01/20 19:33	1
Endrin	0.000025	U	0.000025		mg/L		03/30/20 14:48	04/01/20 19:33	1
gamma-BHC (Lindane)	0.000025	U	0.000025		mg/L		03/30/20 14:48	04/01/20 19:33	1
Methoxychlor	0.000025	U	0.000025		mg/L		03/30/20 14:48	04/01/20 19:33	1

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography (Continued)

Lab Sample ID: MB 680-613231/20-A
Matrix: Water
Analysis Batch: 613591

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 613231

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor	0.000025	U	0.000025		mg/L		03/30/20 14:48	04/01/20 19:33	1
Toxaphene	0.0025	U	0.0025		mg/L		03/30/20 14:48	04/01/20 19:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*81*		*40 - 130*	*03/30/20 14:48*	*04/01/20 19:33*	*1*
DCBDecachlorobiphenyl	*57*		*14 - 130*	*03/30/20 14:48*	*04/01/20 19:33*	*1*

Lab Sample ID: LCS 680-613231/21-A
Matrix: Water
Analysis Batch: 613591

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 613231

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Heptachlor epoxide	0.0000500	0.0000516		mg/L		103	52 - 130
Endrin	0.0000500	0.0000528		mg/L		106	59 - 143
gamma-BHC (Lindane)	0.0000500	0.0000523		mg/L		105	52 - 130
Methoxychlor	0.0000500	0.0000514		mg/L		103	52 - 136
Heptachlor	0.0000500	0.0000450		mg/L		90	35 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*76*		*40 - 130*
DCBDecachlorobiphenyl	*29*		*14 - 130*

Lab Sample ID: LB 680-612479/1-E
Matrix: Water
Analysis Batch: 613591

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 613231

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:18	1
Chlordane (technical)	0.012	U	0.012		mg/L		03/30/20 14:48	04/01/20 19:18	1
Endrin	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:18	1
gamma-BHC (Lindane)	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:18	1
Methoxychlor	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:18	1
Heptachlor	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:18	1
Toxaphene	0.12	U	0.12		mg/L		03/30/20 14:48	04/01/20 19:18	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*91*		*40 - 130*	*03/30/20 14:48*	*04/01/20 19:18*	*1*
DCBDecachlorobiphenyl	*78*		*14 - 130*	*03/30/20 14:48*	*04/01/20 19:18*	*1*

Lab Sample ID: LB 680-612482/1-D
Matrix: Water
Analysis Batch: 613591

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 613231

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:03	1
Chlordane (technical)	0.012	U	0.012		mg/L		03/30/20 14:48	04/01/20 19:03	1
Endrin	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:03	1

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography (Continued)

Lab Sample ID: LB 680-612482/1-D
Matrix: Water
Analysis Batch: 613591

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 613231

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
gamma-BHC (Lindane)	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:03	1
Methoxychlor	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:03	1
Heptachlor	0.0012	U	0.0012		mg/L		03/30/20 14:48	04/01/20 19:03	1
Toxaphene	0.12	U	0.12		mg/L		03/30/20 14:48	04/01/20 19:03	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*81*		*40 - 130*	*03/30/20 14:48*	*04/ 01/20 19:03*	*1*
DCBDecachlorobiphenyl	*66*		*14 - 130*	*03/ 30/20 14:48*	*04/01/20 19:03*	*1*

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography

Lab Sample ID: MB 680-611419/10
Matrix: Water
Analysis Batch: 611419

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.050	U	0.050		mg/L			03/18/20 01:58	1
Nitrite as N	0.050	U	0.050		mg/L			03/18/20 01:58	1

Lab Sample ID: LCS 680-611419/11
Matrix: Water
Analysis Batch: 611419

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.999	0.950		mg/L		95	90 - 110
Nitrite as N	0.997	1.02		mg/L		103	90 - 110

Lab Sample ID: LCSD 680-611419/12
Matrix: Water
Analysis Batch: 611419

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	0.999	0.959		mg/L		96	90 - 110	1	15
Nitrite as N	0.997	1.03		mg/L		103	90 - 110	0	15

Lab Sample ID: MB 680-611983/2
Matrix: Water
Analysis Batch: 611983

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	0.50	U	0.50		mg/L			03/21/20 13:11	1
Chloride	0.50	U	0.50		mg/L			03/21/20 13:11	1
Fluoride	0.10	U	0.10		mg/L			03/21/20 13:11	1
Sulfate	1.0	U	1.0		mg/L			03/21/20 13:11	1

Method: 300.0-1993 R2.1 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 680-611983/3
Matrix: Water
Analysis Batch: 611983

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	10.0	10.2		mg/L		102	90 - 110
Chloride	10.0	10.1		mg/L		101	90 - 110
Fluoride	2.00	2.15		mg/L		107	90 - 110
Sulfate	10.0	10.4		mg/L		104	90 - 110

Lab Sample ID: LCSD 680-611983/4
Matrix: Water
Analysis Batch: 611983

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bromide	10.0	10.2		mg/L		102	90 - 110	0	15
Chloride	10.0	10.1		mg/L		101	90 - 110	0	15
Fluoride	2.00	2.18		mg/L		109	90 - 110	2	15
Sulfate	10.0	10.6		mg/L		106	90 - 110	1	15

Lab Sample ID: MB 680-612283/2
Matrix: Water
Analysis Batch: 612283

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	0.50	U	0.50		mg/L			03/24/20 11:35	1
Chloride	0.50	U	0.50		mg/L			03/24/20 11:35	1
Fluoride	0.10	U	0.10		mg/L			03/24/20 11:35	1
Sulfate	1.0	U	1.0		mg/L			03/24/20 11:35	1

Lab Sample ID: LCS 680-612283/3
Matrix: Water
Analysis Batch: 612283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromide	10.0	10.2		mg/L		102	90 - 110
Chloride	10.0	10.1		mg/L		101	90 - 110
Fluoride	2.00	2.16		mg/L		108	90 - 110
Sulfate	10.0	10.4		mg/L		104	90 - 110

Lab Sample ID: LCSD 680-612283/4
Matrix: Water
Analysis Batch: 612283

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bromide	10.0	10.2		mg/L		102	90 - 110	0	15
Chloride	10.0	10.1		mg/L		101	90 - 110	1	15
Fluoride	2.00	2.18		mg/L		109	90 - 110	1	15
Sulfate	10.0	10.6		mg/L		106	90 - 110	1	15

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 680-611631/1-B
Matrix: Water
Analysis Batch: 611794

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 611633

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	100	U	100		ug/L		03/19/20 09:59	03/20/20 00:58	1
Arsenic	3.0	U	3.0		ug/L		03/19/20 09:59	03/20/20 00:58	1
Chromium	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 00:58	1
Copper	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 00:58	1
Iron	100	U	100		ug/L		03/19/20 09:59	03/20/20 00:58	1
Manganese	5.0	U	5.0		ug/L		03/19/20 09:59	03/20/20 00:58	1
Zinc	20	U	20		ug/L		03/19/20 09:59	03/20/20 00:58	1

Lab Sample ID: LCS 680-611631/2-B
Matrix: Water
Analysis Batch: 611794

Client Sample ID: Lab Control Sample
Prep Type: Dissolved
Prep Batch: 611633

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5000	4980		ug/L		100	80 - 120
Arsenic	100	107		ug/L		107	80 - 120
Chromium	100	103		ug/L		103	80 - 120
Copper	100	102		ug/L		102	80 - 120
Iron	5010	4730		ug/L		94	80 - 120
Manganese	400	404		ug/L		101	80 - 120
Zinc	101	103		ug/L		103	80 - 120

Method: 2320B-2011 - Alkalinity, Total

Lab Sample ID: MB 680-612643/1
Matrix: Water
Analysis Batch: 612643

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	5.0	U	5.0		mg/L			03/25/20 17:40	1
Bicarbonate Alkalinity as CaCO3	5.0	U	5.0		mg/L			03/25/20 17:40	1
Carbonate Alkalinity as CaCO3	5.0	U	5.0		mg/L			03/25/20 17:40	1
Hydroxide Alkalinity	5.0	U	5.0		mg/L			03/25/20 17:40	1
Carbon Dioxide, Free	5.0	U	5.0		mg/L			03/25/20 17:40	1
Phenolphthalein Alkalinity	5.0	U	5.0		mg/L			03/25/20 17:40	1
Bicarbonate ion as HCO3	6.1	U	6.1		mg/L			03/25/20 17:40	1

Lab Sample ID: LCS 680-612643/2
Matrix: Water
Analysis Batch: 612643

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	250	257		mg/L		103	90 - 112

Lab Sample ID: LCSD 680-612643/28
Matrix: Water
Analysis Batch: 612643

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	250	278		mg/L		111	90 - 112	8	30

Method: 2540 D-2011 - Total Suspended Solids (Dried at 103-105°C)

Lab Sample ID: MB 680-611491/1
Matrix: Water
Analysis Batch: 611491

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	1.0	U	1.0		mg/L			03/18/20 12:01	1

Lab Sample ID: LCS 680-611491/2
Matrix: Water
Analysis Batch: 611491

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			951	902		mg/L		95	80 - 120		

Lab Sample ID: LCSD 680-611491/3
Matrix: Water
Analysis Batch: 611491

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids			951	922		mg/L		97	80 - 120	2	25

Method: 2540C-2011 - Total Dissolved Solids (Dried at 180 °C)

Lab Sample ID: MB 680-611460/1
Matrix: Water
Analysis Batch: 611460

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5.0	U	5.0		mg/L			03/18/20 09:32	1

Lab Sample ID: LCS 680-611460/2
Matrix: Water
Analysis Batch: 611460

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			2460	2420		mg/L		98	80 - 120		

Lab Sample ID: LCSD 680-611460/3
Matrix: Water
Analysis Batch: 611460

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			2460	2380		mg/L		97	80 - 120	2	25

Method: 9060 - Organic Carbon, Dissolved (DOC)

Lab Sample ID: MB 680-612390/1-A
Matrix: Water
Analysis Batch: 612569

Client Sample ID: Method Blank
Prep Type: Dissolved

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0	U	1.0		mg/L			03/25/20 01:04	1

Method: 9060 - Organic Carbon, Dissolved (DOC) (Continued)

Lab Sample ID: LCS 680-612390/2-A
Matrix: Water
Analysis Batch: 612569

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	20.0	19.6		mg/L		98	80 - 120
DOC Result 1	20.0	19.5		mg/L		98	80 - 120
DOC Result 2	20.0	19.4		mg/L		97	80 - 120
DOC Result 3	20.0	19.7		mg/L		98	80 - 120
DOC Result 4	20.0	19.7		mg/L		98	80 - 120

Lab Sample ID: LCSD 680-612390/3-A
Matrix: Water
Analysis Batch: 612569

Client Sample ID: Lab Control Sample Dup
Prep Type: Dissolved

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	20.0	19.7		mg/L		99	80 - 120	1	20
DOC Result 1	20.0	19.8		mg/L		99	80 - 120	1	20
DOC Result 2	20.0	19.4		mg/L		97	80 - 120	0	20
DOC Result 3	20.0	19.8		mg/L		99	80 - 120	1	20
DOC Result 4	20.0	19.9		mg/L		99	80 - 120	1	20

Lab Sample ID: 680-181592-1 MS
Matrix: Water
Analysis Batch: 612569

Client Sample ID: PT-03-03122020
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	18		20.0	38.0		mg/L		100	80 - 120
DOC Result 1	18		20.0	38.0		mg/L		100	80 - 120
DOC Result 2	18		20.0	37.8		mg/L		100	80 - 120
DOC Result 3	18		20.0	37.9		mg/L		99	80 - 120
DOC Result 4	18		20.0	38.3		mg/L		101	80 - 120

Lab Sample ID: 680-181592-1 MSD
Matrix: Water
Analysis Batch: 612569

Client Sample ID: PT-03-03122020
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	18		20.0	37.8		mg/L		99	80 - 120	1	20
DOC Result 1	18		20.0	37.2		mg/L		96	80 - 120	2	20
DOC Result 2	18		20.0	38.2		mg/L		102	80 - 120	1	20
DOC Result 3	18		20.0	37.7		mg/L		98	80 - 120	1	20
DOC Result 4	18		20.0	38.0		mg/L		100	80 - 120	1	20

Method: 9060A - Organic Carbon, Total (TOC)

Lab Sample ID: MB 680-611782/2
Matrix: Water
Analysis Batch: 611782

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U	1.0		mg/L			03/20/20 00:40	1
Total Organic Carbon - Quad	1.0	U	1.0		mg/L			03/20/20 00:40	1

Method: 9060A - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: LCS 680-611782/3
Matrix: Water
Analysis Batch: 611782

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	20.0	19.8		mg/L		99	80 - 120
Total Organic Carbon - Quad	20.0	19.8		mg/L		99	80 - 120
TOC Result 1	20.0	19.8		mg/L		99	80 - 120
TOC Result 2	20.0	19.7		mg/L		98	80 - 120
TOC Result 3	20.0	20.0		mg/L		100	80 - 120
TOC Result 4	20.0	19.8		mg/L		99	80 - 120

Lab Sample ID: LCSD 680-611782/4
Matrix: Water
Analysis Batch: 611782

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	20.0	19.8		mg/L		99	80 - 120	0	25
Total Organic Carbon - Quad	20.0	19.8		mg/L		99	80 - 120	0	25
TOC Result 1	20.0	19.7		mg/L		99	80 - 120	1	25
TOC Result 2	20.0	19.8		mg/L		99	80 - 120	0	25
TOC Result 3	20.0	20.0		mg/L		100	80 - 120	0	25
TOC Result 4	20.0	19.9		mg/L		99	80 - 120	0	25

GC/MS VOA

Analysis Batch: 612405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	8260B	
680-181592-2	PT-02-03122020	Total/NA	Water	8260B	
680-181592-3	PT-01-03122020	Total/NA	Water	8260B	
680-181592-5	Trip Blank	Total/NA	Water	8260B	
MB 680-612405/10	Method Blank	Total/NA	Water	8260B	
LCS 680-612405/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-612405/5	Lab Control Sample Dup	Total/NA	Water	8260B	

Leach Batch: 612631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-4	01-PT-03122020	TCLP	Water	1311	
LB 680-612631/1-A	Method Blank	TCLP	Water	1311	

Analysis Batch: 612806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-4	01-PT-03122020	TCLP	Water	8260B	612631
LB 680-612631/1-A	Method Blank	TCLP	Water	8260B	612631
MB 680-612806/9	Method Blank	Total/NA	Water	8260B	
LCS 680-612806/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-612806/4	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 614683

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1 - DL	PT-03-03122020	Total/NA	Water	8260B	
680-181592-2 - DL	PT-02-03122020	Total/NA	Water	8260B	
680-181592-3 - DL	PT-01-03122020	Total/NA	Water	8260B	
MB 680-614683/10	Method Blank	Total/NA	Water	8260B	
LCS 680-614683/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-614683/5	Lab Control Sample Dup	Total/NA	Water	8260B	

GC Semi VOA

Prep Batch: 611711

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	3520C	
680-181592-2	PT-02-03122020	Total/NA	Water	3520C	
680-181592-3	PT-01-03122020	Total/NA	Water	3520C	
MB 680-611711/18-A	Method Blank	Total/NA	Water	3520C	
LCS 680-611711/19-A	Lab Control Sample	Total/NA	Water	3520C	
LCS 680-611711/24-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 680-611711/20-A	Lab Control Sample Dup	Total/NA	Water	3520C	
LCSD 680-611711/25-A	Lab Control Sample Dup	Total/NA	Water	3520C	

Leach Batch: 612479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 680-612479/1-E	Method Blank	TCLP	Water	1311	

Leach Batch: 612482

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-4	01-PT-03122020	TCLP	Water	1311	
LB 680-612482/1-D	Method Blank	TCLP	Water	1311	

GC Semi VOA

Analysis Batch: 612510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	8081B/8082A	611711
680-181592-2	PT-02-03122020	Total/NA	Water	8081B/8082A	611711
680-181592-3	PT-01-03122020	Total/NA	Water	8081B/8082A	611711
MB 680-611711/18-A	Method Blank	Total/NA	Water	8081B/8082A	611711
LCS 680-611711/19-A	Lab Control Sample	Total/NA	Water	8081B/8082A	611711
LCS 680-611711/24-A	Lab Control Sample	Total/NA	Water	8081B/8082A	611711
LCSD 680-611711/20-A	Lab Control Sample Dup	Total/NA	Water	8081B/8082A	611711
LCSD 680-611711/25-A	Lab Control Sample Dup	Total/NA	Water	8081B/8082A	611711

Prep Batch: 613231

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-4	01-PT-03122020	TCLP	Water	3520C	612482
LB 680-612479/1-E	Method Blank	TCLP	Water	3520C	612479
LB 680-612482/1-D	Method Blank	TCLP	Water	3520C	612482
MB 680-613231/20-A	Method Blank	Total/NA	Water	3520C	
LCS 680-613231/21-A	Lab Control Sample	Total/NA	Water	3520C	

Analysis Batch: 613591

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 680-612479/1-E	Method Blank	TCLP	Water	8081B/8082A	613231
LB 680-612482/1-D	Method Blank	TCLP	Water	8081B/8082A	613231
MB 680-613231/20-A	Method Blank	Total/NA	Water	8081B/8082A	613231
LCS 680-613231/21-A	Lab Control Sample	Total/NA	Water	8081B/8082A	613231

Analysis Batch: 614275

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-4	01-PT-03122020	TCLP	Water	8081B/8082A	613231

HPLC/IC

Analysis Batch: 611419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	300.0-1993 R2.1	
680-181592-2	PT-02-03122020	Total/NA	Water	300.0-1993 R2.1	
680-181592-3	PT-01-03122020	Total/NA	Water	300.0-1993 R2.1	
MB 680-611419/10	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-611419/11	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-611419/12	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	

Analysis Batch: 611983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	300.0-1993 R2.1	
680-181592-2	PT-02-03122020	Total/NA	Water	300.0-1993 R2.1	
680-181592-3	PT-01-03122020	Total/NA	Water	300.0-1993 R2.1	
MB 680-611983/2	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-611983/3	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-611983/4	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	

Analysis Batch: 612283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1 - DL	PT-03-03122020	Total/NA	Water	300.0-1993 R2.1	

HPLC/IC (Continued)

Analysis Batch: 612283 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-2 - DL	PT-02-03122020	Total/NA	Water	300.0-1993 R2.1	
680-181592-3 - DL	PT-01-03122020	Total/NA	Water	300.0-1993 R2.1	
MB 680-612283/2	Method Blank	Total/NA	Water	300.0-1993 R2.1	
LCS 680-612283/3	Lab Control Sample	Total/NA	Water	300.0-1993 R2.1	
LCSD 680-612283/4	Lab Control Sample Dup	Total/NA	Water	300.0-1993 R2.1	

Metals

Filtration Batch: 611631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Dissolved	Water	FILTRATION	
680-181592-2	PT-02-03122020	Dissolved	Water	FILTRATION	
680-181592-3	PT-01-03122020	Dissolved	Water	FILTRATION	
MB 680-611631/1-B	Method Blank	Dissolved	Water	FILTRATION	
LCS 680-611631/2-B	Lab Control Sample	Dissolved	Water	FILTRATION	

Prep Batch: 611633

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Dissolved	Water	3005A	611631
680-181592-2	PT-02-03122020	Dissolved	Water	3005A	611631
680-181592-3	PT-01-03122020	Dissolved	Water	3005A	611631
MB 680-611631/1-B	Method Blank	Dissolved	Water	3005A	611631
LCS 680-611631/2-B	Lab Control Sample	Dissolved	Water	3005A	611631

Analysis Batch: 611794

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Dissolved	Water	6020A	611633
680-181592-2	PT-02-03122020	Dissolved	Water	6020A	611633
680-181592-3	PT-01-03122020	Dissolved	Water	6020A	611633
MB 680-611631/1-B	Method Blank	Dissolved	Water	6020A	611633
LCS 680-611631/2-B	Lab Control Sample	Dissolved	Water	6020A	611633

Analysis Batch: 612188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	SM 2340B	
680-181592-2	PT-02-03122020	Total/NA	Water	SM 2340B	
680-181592-3	PT-01-03122020	Total/NA	Water	SM 2340B	

General Chemistry

Analysis Batch: 611460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	2540C-2011	
680-181592-2	PT-02-03122020	Total/NA	Water	2540C-2011	
680-181592-3	PT-01-03122020	Total/NA	Water	2540C-2011	
MB 680-611460/1	Method Blank	Total/NA	Water	2540C-2011	
LCS 680-611460/2	Lab Control Sample	Total/NA	Water	2540C-2011	
LCSD 680-611460/3	Lab Control Sample Dup	Total/NA	Water	2540C-2011	

Analysis Batch: 611491

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	2540 D-2011	

General Chemistry (Continued)

Analysis Batch: 611491 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-2	PT-02-03122020	Total/NA	Water	2540 D-2011	
680-181592-3	PT-01-03122020	Total/NA	Water	2540 D-2011	
MB 680-611491/1	Method Blank	Total/NA	Water	2540 D-2011	
LCS 680-611491/2	Lab Control Sample	Total/NA	Water	2540 D-2011	
LCSD 680-611491/3	Lab Control Sample Dup	Total/NA	Water	2540 D-2011	

Analysis Batch: 611782

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	9060A	
680-181592-2	PT-02-03122020	Total/NA	Water	9060A	
680-181592-3	PT-01-03122020	Total/NA	Water	9060A	
MB 680-611782/2	Method Blank	Total/NA	Water	9060A	
LCS 680-611782/3	Lab Control Sample	Total/NA	Water	9060A	
LCSD 680-611782/4	Lab Control Sample Dup	Total/NA	Water	9060A	

Filtration Batch: 612390

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Dissolved	Water	FILTRATION	
680-181592-2	PT-02-03122020	Dissolved	Water	FILTRATION	
680-181592-3	PT-01-03122020	Dissolved	Water	FILTRATION	
MB 680-612390/1-A	Method Blank	Dissolved	Water	FILTRATION	
LCS 680-612390/2-A	Lab Control Sample	Dissolved	Water	FILTRATION	
LCSD 680-612390/3-A	Lab Control Sample Dup	Dissolved	Water	FILTRATION	
680-181592-1 MS	PT-03-03122020	Dissolved	Water	FILTRATION	
680-181592-1 MSD	PT-03-03122020	Dissolved	Water	FILTRATION	

Analysis Batch: 612569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Dissolved	Water	9060	612390
680-181592-2	PT-02-03122020	Dissolved	Water	9060	612390
680-181592-3	PT-01-03122020	Dissolved	Water	9060	612390
MB 680-612390/1-A	Method Blank	Dissolved	Water	9060	612390
LCS 680-612390/2-A	Lab Control Sample	Dissolved	Water	9060	612390
LCSD 680-612390/3-A	Lab Control Sample Dup	Dissolved	Water	9060	612390
680-181592-1 MS	PT-03-03122020	Dissolved	Water	9060	612390
680-181592-1 MSD	PT-03-03122020	Dissolved	Water	9060	612390

Analysis Batch: 612643

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181592-1	PT-03-03122020	Total/NA	Water	2320B-2011	
680-181592-2	PT-02-03122020	Total/NA	Water	2320B-2011	
680-181592-3	PT-01-03122020	Total/NA	Water	2320B-2011	
MB 680-612643/1	Method Blank	Total/NA	Water	2320B-2011	
LCS 680-612643/2	Lab Control Sample	Total/NA	Water	2320B-2011	
LCSD 680-612643/28	Lab Control Sample Dup	Total/NA	Water	2320B-2011	

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: PT-03-03122020

Lab Sample ID: 680-181592-1

Date Collected: 03/12/20 20:20

Matrix: Water

Date Received: 03/14/20 10:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B	DL	5	5 mL	5 mL	614683	04/10/20 18:50	SMP	TAL SAV
	Instrument ID: CMSB									
Total/NA	Analysis	8260B		1	5 mL	5 mL	612405	03/25/20 16:37	P1C	TAL SAV
	Instrument ID: CMSC									
Total/NA	Prep	3520C			251.4 mL	2.5 mL	611711	03/19/20 18:02	EHS	TAL SAV
Total/NA	Analysis	8081B/8082A		1	1 mL	1.0 mL	612510	03/25/20 21:17	JCK	TAL SAV
	Instrument ID: CSGZ									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	611983	03/21/20 17:50	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	300.0-1993 R2.1	DL	100	5 mL	5 mL	612283	03/24/20 19:16	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	611419	03/18/20 03:43	CS	TAL SAV
	Instrument ID: CICL									
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	611631	03/19/20 09:57	AJR	TAL SAV
Dissolved	Prep	3005A			50 mL	250 mL	611633	03/19/20 09:59	AJR	TAL SAV
Dissolved	Analysis	6020A		1			611794	03/20/20 01:54	BWR	TAL SAV
	Instrument ID: ICPMSC									
Total/NA	Analysis	SM 2340B		1			612188	03/25/20 15:35	BCB	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	2320B-2011		1			612643	03/25/20 20:07	JER	TAL SAV
	Instrument ID: MANTECH									
Total/NA	Analysis	2540 D-2011		1	1000 mL	1000 mL	611491	03/18/20 12:01	PG	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	2540C-2011		1	1 mL	200 mL	611460	03/18/20 09:32	PG	TAL SAV
	Instrument ID: NOEQUIP									
Dissolved	Filtration	FILTRATION			40 mL	40 mL	612390	03/24/20 20:07	RKJ	TAL SAV
Dissolved	Analysis	9060		1	40 mL	40 mL	612569	03/25/20 01:53	RKJ	TAL SAV
	Instrument ID: TOC7									
Total/NA	Analysis	9060A		1	40 mL	40 mL	611782	03/20/20 03:13	RKJ	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: PT-02-03122020

Lab Sample ID: 680-181592-2

Date Collected: 03/12/20 17:00

Matrix: Water

Date Received: 03/14/20 10:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B	DL	5	5 mL	5 mL	614683	04/10/20 19:13	SMP	TAL SAV
	Instrument ID: CMSB									
Total/NA	Analysis	8260B		1	5 mL	5 mL	612405	03/25/20 17:00	P1C	TAL SAV
	Instrument ID: CMSC									
Total/NA	Prep	3520C			259.2 mL	2.5 mL	611711	03/19/20 18:02	EHS	TAL SAV
Total/NA	Analysis	8081B/8082A		1	1 mL	1.0 mL	612510	03/25/20 21:32	JCK	TAL SAV
	Instrument ID: CSGZ									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	611983	03/21/20 18:03	UI	TAL SAV
	Instrument ID: CICK									

Client Sample ID: PT-02-03122020

Lab Sample ID: 680-181592-2

Date Collected: 03/12/20 17:00

Matrix: Water

Date Received: 03/14/20 10:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0-1993 R2.1	DL	100	5 mL	5 mL	612283	03/24/20 19:29	UI	TAL SAV
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	611419	03/18/20 03:58	CS	TAL SAV
	Instrument ID: CICL									
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	611631	03/19/20 09:57	AJR	TAL SAV
Dissolved	Prep	3005A			50 mL	250 mL	611633	03/19/20 09:59	AJR	TAL SAV
Dissolved	Analysis	6020A		1			611794	03/20/20 01:32	BWR	TAL SAV
	Instrument ID: ICPMSC									
Total/NA	Analysis	SM 2340B		1			612188	03/25/20 15:35	BCB	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	2320B-2011		1			612643	03/25/20 20:15	JER	TAL SAV
	Instrument ID: MANTECH									
Total/NA	Analysis	2540 D-2011		1	500 mL	1000 mL	611491	03/18/20 12:01	PG	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	2540C-2011		1	1 mL	200 mL	611460	03/18/20 09:32	PG	TAL SAV
	Instrument ID: NOEQUIP									
Dissolved	Filtration	FILTRATION			40 mL	40 mL	612390	03/24/20 20:07	RKJ	TAL SAV
Dissolved	Analysis	9060		1	40 mL	40 mL	612569	03/25/20 02:44	RKJ	TAL SAV
	Instrument ID: TOC7									
Total/NA	Analysis	9060A		1	40 mL	40 mL	611782	03/20/20 03:31	RKJ	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: PT-01-03122020

Lab Sample ID: 680-181592-3

Date Collected: 03/12/20 15:00

Matrix: Water

Date Received: 03/14/20 10:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B	DL	5	5 mL	5 mL	614683	04/10/20 19:37	SMP	TAL SAV
	Instrument ID: CMSB									
Total/NA	Analysis	8260B		1	5 mL	5 mL	612405	03/25/20 17:23	P1C	TAL SAV
	Instrument ID: CMSC									
Total/NA	Prep	3520C			253.1 mL	2.5 mL	611711	03/19/20 18:02	EHS	TAL SAV
Total/NA	Analysis	8081B/8082A		1	1 mL	1.0 mL	612510	03/25/20 21:47	JCK	TAL SAV
	Instrument ID: CSGZ									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	611983	03/21/20 18:16	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	300.0-1993 R2.1	DL	100	5 mL	5 mL	612283	03/24/20 19:41	UI	TAL SAV
	Instrument ID: CICK									
Total/NA	Analysis	300.0-1993 R2.1		1	5 mL	5 mL	611419	03/18/20 04:12	CS	TAL SAV
	Instrument ID: CICL									
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	611631	03/19/20 09:57	AJR	TAL SAV
Dissolved	Prep	3005A			50 mL	250 mL	611633	03/19/20 09:59	AJR	TAL SAV
Dissolved	Analysis	6020A		1			611794	03/20/20 01:43	BWR	TAL SAV
	Instrument ID: ICPMSC									
Total/NA	Analysis	SM 2340B		1			612188	03/25/20 15:35	BCB	TAL SAV
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

Client Sample ID: PT-01-03122020

Lab Sample ID: 680-181592-3

Date Collected: 03/12/20 15:00

Matrix: Water

Date Received: 03/14/20 10:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2320B-2011		1			612643	03/25/20 20:23	JER	TAL SAV
Total/NA	Analysis	2540 D-2011		1	500 mL	1000 mL	611491	03/18/20 12:01	PG	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	2540C-2011		1	1 mL	200 mL	611460	03/18/20 09:32	PG	TAL SAV
	Instrument ID: NOEQUIP									
Dissolved	Filtration	FILTRATION			40 mL	40 mL	612390	03/24/20 20:07	RKJ	TAL SAV
Dissolved	Analysis	9060		1	40 mL	40 mL	612569	03/25/20 03:01	RKJ	TAL SAV
	Instrument ID: TOC7									
Total/NA	Analysis	9060A		1	40 mL	40 mL	611782	03/20/20 03:48	RKJ	TAL SAV
	Instrument ID: TOC7									

Client Sample ID: 01-PT-03122020

Lab Sample ID: 680-181592-4

Date Collected: 03/12/20 17:00

Matrix: Water

Date Received: 03/14/20 10:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			1.0 g	100 mL	612631	03/26/20 08:13	JEB	TAL SAV
TCLP	Analysis	8260B		20	5 mL	5 mL	612806	03/27/20 16:35	UI	TAL SAV
	Instrument ID: CMSB									
TCLP	Leach	1311			1.0 g	1.0 mL	612482	03/25/20 17:45	EHS	TAL SAV
TCLP	Prep	3520C			20.3 mL	5 mL	613231	03/30/20 14:48	EHS	TAL SAV
TCLP	Analysis	8081B/8082A		1			614275	04/07/20 21:33	JCK	TAL SAV
	Instrument ID: CSGZ									

Client Sample ID: Trip Blank

Lab Sample ID: 680-181592-5

Date Collected: 03/12/20 00:00

Matrix: Water

Date Received: 03/14/20 10:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	612405	03/25/20 11:09	P1C	TAL SAV
	Instrument ID: CMSC									

Laboratory References:

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone (912) 354-7858 Fax (912) 352-0165

Chain of Custody Record

eurofins Environment Testing TestAmerica

4/23/2020

Client Information	Sampler: Nardos Tilahun	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-113421-43565.1
Client Contact: Adria Reimer	Phone: 678 202 9500	E-Mail: jerry.lanier@testamericainc.com		Page: Page 1 of 1
Company: Geosyntec Consultants, Inc.				Job #:
Address: 1255 Roberts Blvd, NW Suite 200	Due Date Requested:	Analysis Requested		
City: Kennesaw	TAT Requested (days):			
State, Zip: GA, 30144				
Phone:	PO #: PO Pending			
Email: AReimer@Geosyntec.com	WO #:			
Project Name: Hercules - Brunswick TCLP and Totals bot	Project #: 68022943			
Site:	SSOW#:			

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260B - TCLP VOC	8081B_8082A - TCLP Pest	8081B_8082A - Pest	8260B - VOC	2540C - TDS	2540D - TSS	9060_Diss - DOC	2320B - Alkalinity	9056A_OF_28D_D5, 9056A_OF_48H_D5	6010B - Select Dissolved Metals	6010B, SM2340B	9060A - TOC	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	A	N	N	N	N	N	N	D	S		
				Solid																
				Solid																
PT-03-03122020	3/12/20	2020	G	Water	N				X	X	X	X	X	X	X	X	X	X	17	metals are manganese,
PT-02-03122020	3/12/20	1700	G	Water	N				X	X	X	X	X	X	X	X	X	X	17	iron, arsenic, Aluminum
PT-01-03122020	3/12/20	1500	G	Water	N				X	X	X	X	X	X	X	X	X	X	17	copper, chromium, zinc.
01-PT-03122020	3/12/20	1700	G	Water	N		X	X											8	Anions are Chloride,
Trip Blank	—	—	—	Water															2	bromide, Fluoride,
				Water																nitrate, nitrite, Sulfate
				Water																- Site specific VOCs
																				and pesticides

680-181592 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

San., retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Nardos Tilahun	3/13/2020, 1545	Geosyntec		3.14.20 1025	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 1.8/2.2 4.3/4.7

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 680-181592-1

Login Number: 181592

List Number: 1

Creator: Sims, Robert D

List Source: Eurofins TestAmerica, Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Accreditation/Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick

Job ID: 680-181592-1

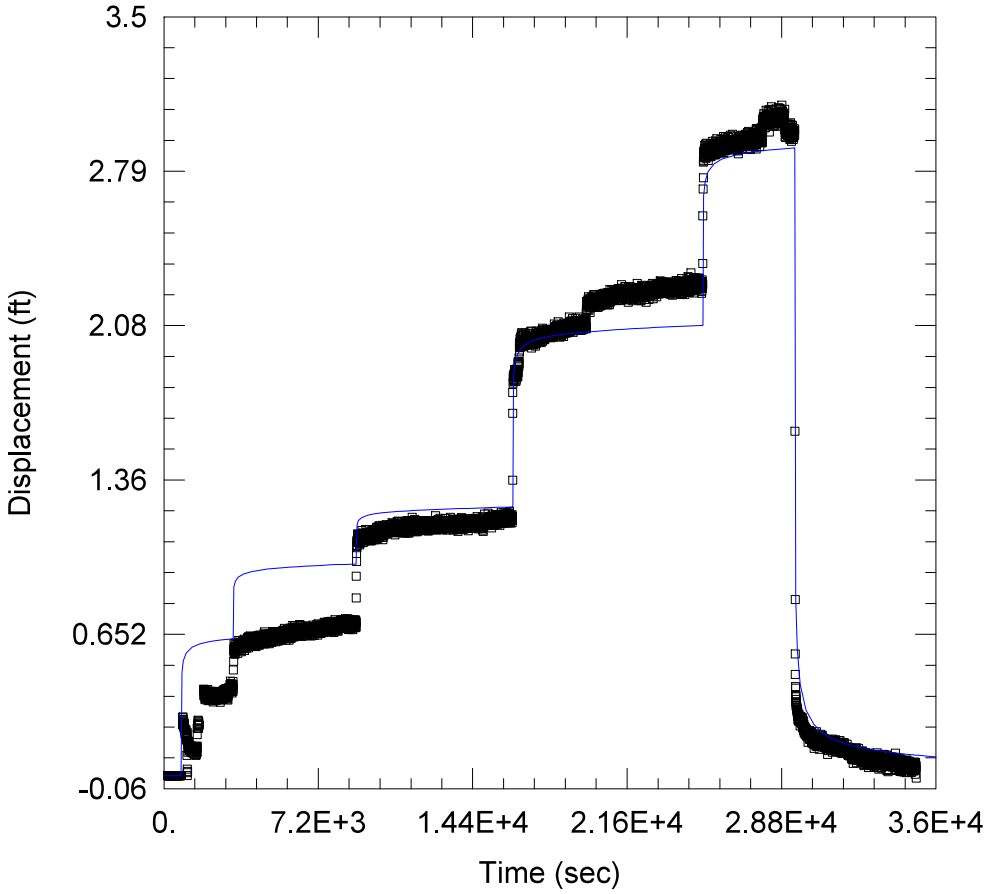
Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E87052	06-30-20
Georgia	State	E87052	06-30-20

APPENDIX E

Step-Drawdown and Recovery Test Data Plots



APT-1 STEP DRAWDOWN TEST

Data Set: C:\...\APT-1 Step test analysis_Theis_Confined.aqt
Date: 03/24/20 Time: 18:11:50

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

AQUIFER DATA

Saturated Thickness: 65. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	0	0

Observation Wells

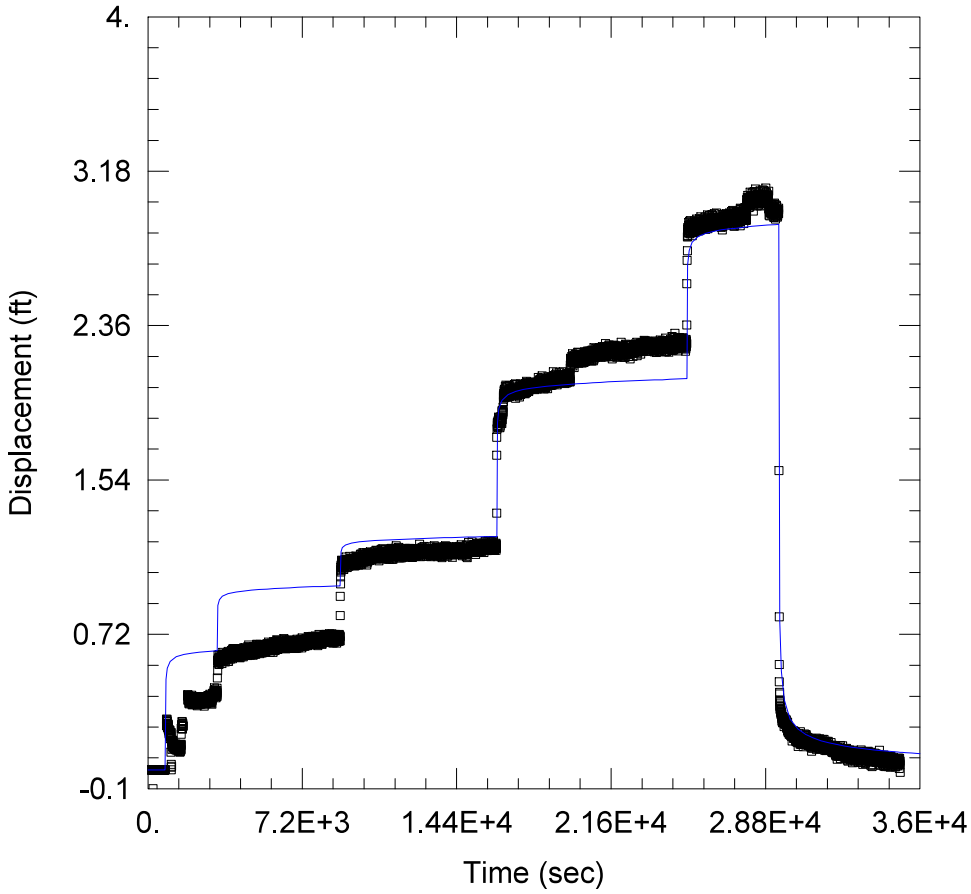
Well Name	X (ft)	Y (ft)
▫ APT-1	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Theis (Step Test)

T = 7059.4 ft^2/day S = 0.01769
Sw = 0. C = 1. sec^2/ft^5
P = 2.

Step Test Model: Jacob-Rorabaugh $s(t) = 0.Q + 1.Q^{2.}$
Time (t) = 1. sec Rate (Q) in cu. ft/sec W.E. = 0.% (Q from last step)



APT-1 STEP DRAWDOWN TEST

Data Set: C:\...\APT-1 Step test analysis_Dougherty-Babu_Confined.aqt
Date: 03/24/20 Time: 17:48:33

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

AQUIFER DATA

Saturated Thickness: 65. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ APT-1	0	0

SOLUTION

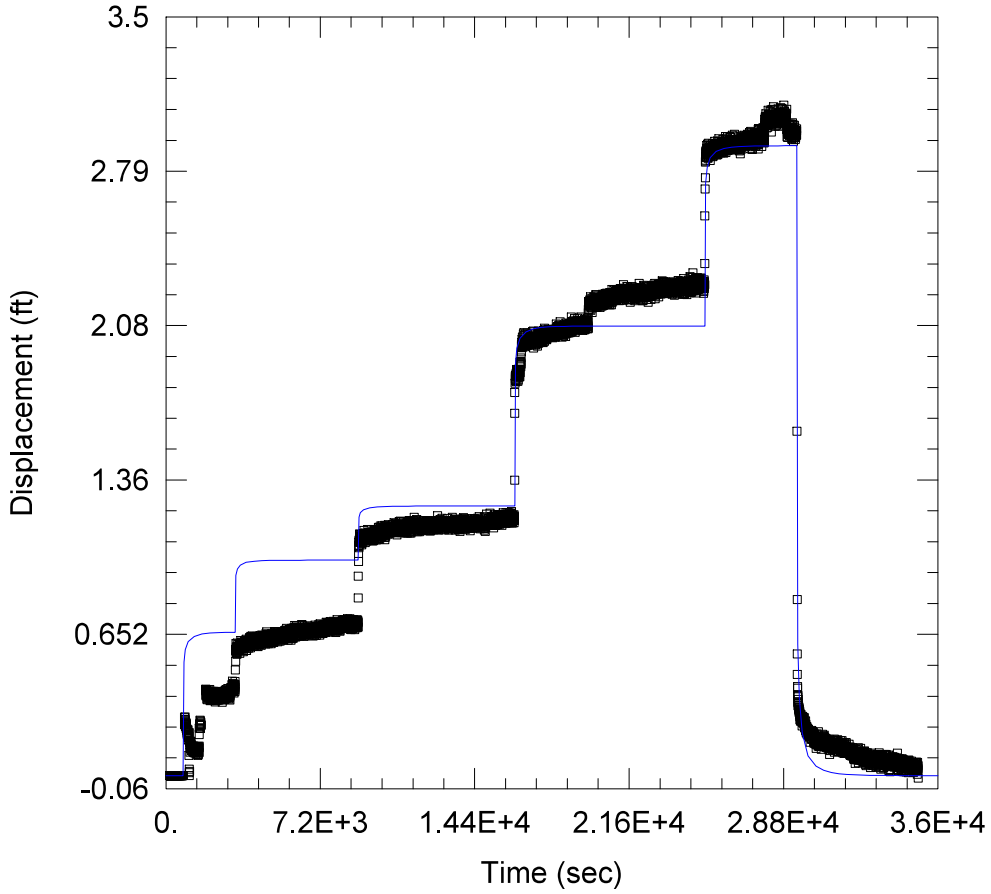
Aquifer Model: Confined Solution Method: Dougherty-Babu

T = 7162.4 ft^2/day
Kz/Kr = 0.1
r(w) = 0.25 ft
C = 1. sec^2/ft^5

S = 0.01007
Sw = 0.
r(c) = 0.25 ft
P = 2.

Step Test Model: Jacob-Rorabaugh
Time (t) = 1. sec Rate (Q) in cu. ft/sec

$s(t) = 0.Q + 1.Q^{2.}$
W.E. = 0.% (Q from last step)



APT-1 STEP DRAWDOWN TEST

Data Set: C:\...\APT-1 Step test analysis_Hantush-Jacob_Leaky.aqt
Date: 03/24/20 Time: 17:58:54

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

AQUIFER DATA

Saturated Thickness: 65. ft
Aquitard Thickness (b'): 6. ft
Anisotropy Ratio (Kz/Kr): 0.1
Aquitard Thickness (b"): 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	0	0

Observation Wells

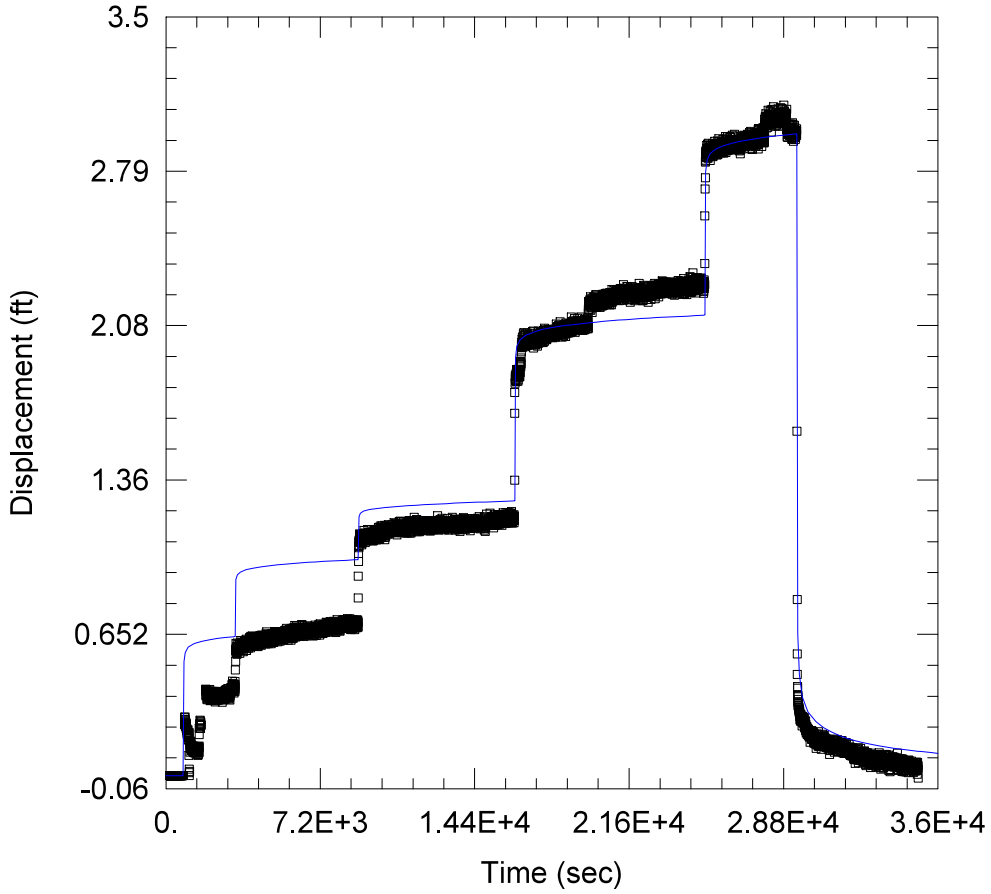
Well Name	X (ft)	Y (ft)
APT-1	0	0

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 6288.7 ft^2/day
r/B = 0.003512
C = 1. sec^2/ft^5
S = 0.0182
Sw = 0.
P = 2.

Step Test Model: Jacob-Rorabaugh
Time (t) = 1. sec Rate (Q) in cu. ft/sec
s(t) = 0.Q + 1.$Q^{2.}$
W.E. = 0.% (Q from last step)



APT-1 STEP DRAWDOWN TEST

Data Set: C:\...\APT-1 Step test analysis_Theis_Confined_K=1.aqt
Date: 03/27/20 Time: 20:43:56

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

AQUIFER DATA

Saturated Thickness: 65. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	0	0

Observation Wells

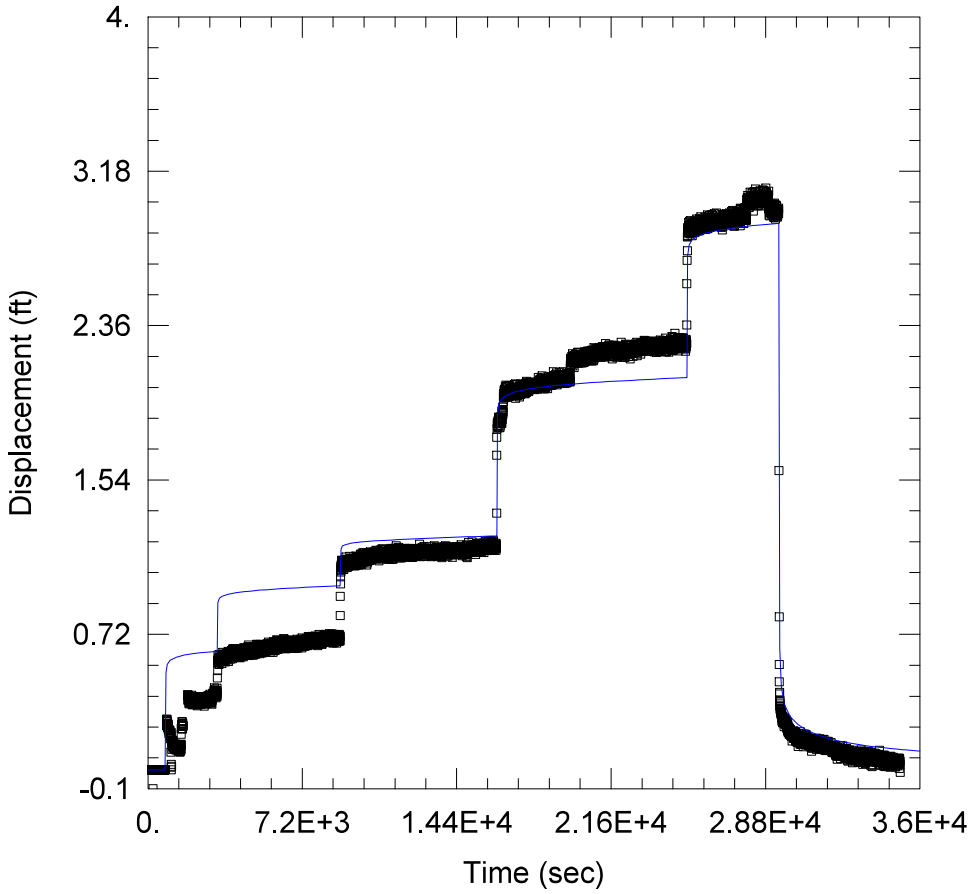
Well Name	X (ft)	Y (ft)
▫ APT-1	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Theis (Step Test)

T = 5939.7 ft^2/day S = 0.01769
Sw = 0. C = 1. sec^2/ft^5
P = 2.

Step Test Model: Jacob-Rorabaugh s(t) = 0.Q + 1.$Q^{2.}$
Time (t) = 1. sec Rate (Q) in cu. ft/sec W.E. = 0.% (Q from last step)



APT-1 STEP DRAWDOWN TEST

Data Set: C:\...\APT-1 Step test analysis_Dougherty-Babu_Confined__Anisotropy=1.aqt
Date: 03/27/20 Time: 20:53:58

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

AQUIFER DATA

Saturated Thickness: 65. ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	0	0

Observation Wells

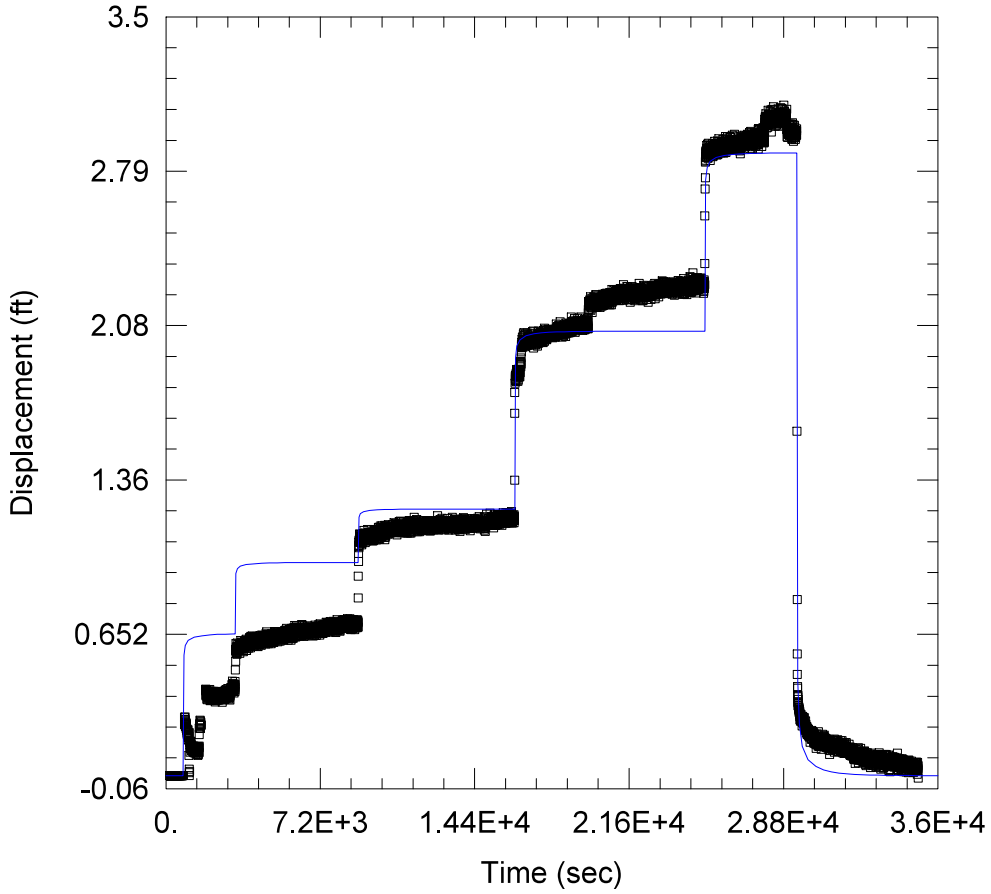
Well Name	X (ft)	Y (ft)
▫ APT-1	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Dougherty-Babu

T = 6175.9 ft^2/day S = 0.01007
Kz/Kr = 1. Sw = 0.
r(w) = 0.25 ft r(c) = 0.25 ft
C = 1. sec^2/ft^5 P = 2.

Step Test Model: Jacob-Rorabaugh $s(t) = 0.Q + 1.Q^{2.}$
Time (t) = 1. sec Rate (Q) in cu. ft/sec W.E. = 0.% (Q from last step)



APT-1 STEP DRAWDOWN TEST

Data Set: C:\...\APT-1 Step test analysis_Hantush-Jacob_Leaky__Anisotropy=1.aqt
Date: 03/27/20 Time: 21:01:21

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

AQUIFER DATA

Saturated Thickness: 65. ft
Aquitard Thickness (b'): 6. ft
Anisotropy Ratio (Kz/Kr): 1.
Aquitard Thickness (b"): 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
APT-1	0	0

SOLUTION

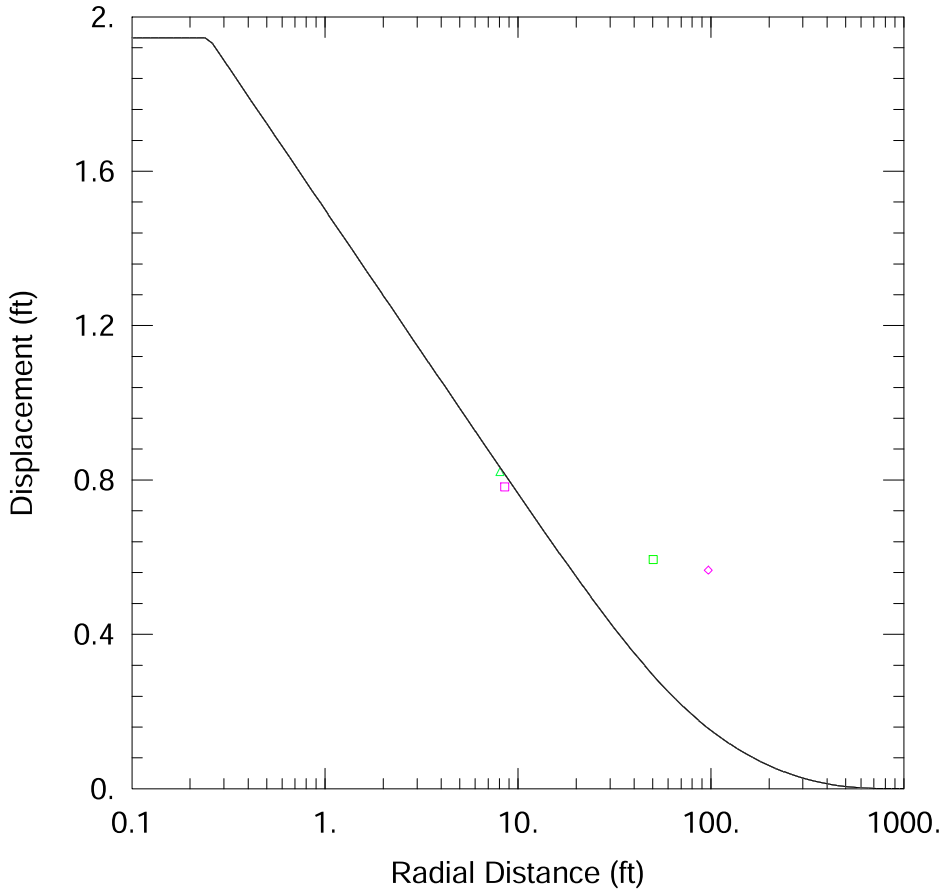
Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 5561.8 ft^2/day
r/B = 0.003512
C = 1. sec^2/ft^5
S = 0.0182
Sw = 0.
P = 2.

Step Test Model: Jacob-Rorabaugh
Time (t) = 1. sec Rate (Q) in cu. ft/sec
s(t) = 0.Q + 1.$Q^{2.}$
W.E. = 0.% (Q from last step)

APPENDIX F

Distance-Drawdown Test Data Plots



WELL TEST ANALYSIS

Data Set: N:\...\Distance-Drawdown_Theis_Step5-72min_No APT.aqt
Date: 12/11/20 Time: 00:33:59

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	872100	425185

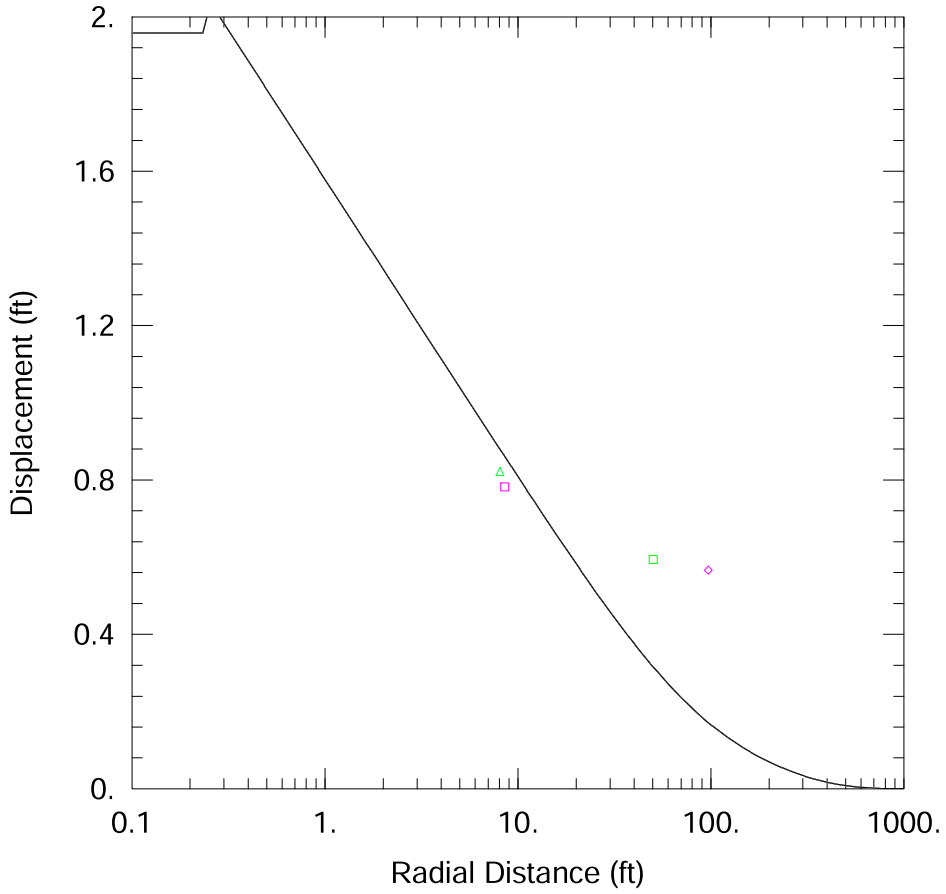
Observation Wells

Well Name	X (ft)	Y (ft)
△ PSOW-8	872101	425177
□ PSOW-10	872103	425193
□ PWOW-1	872120	425139
◇ PWOW-2	872159	425108

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 1.086E+4 ft^2/day
S = 0.01241
Kz/Kr = 0.1
b = 65. ft



WELL TEST ANALYSIS

Data Set: N:\...\Distance-Drawdown_Dougherty-Babu_Step5-72min_No APT.aqt
Date: 01/04/21 Time: 18:34:52

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

AQUIFER DATA

Saturated Thickness: 65. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	872100	425185

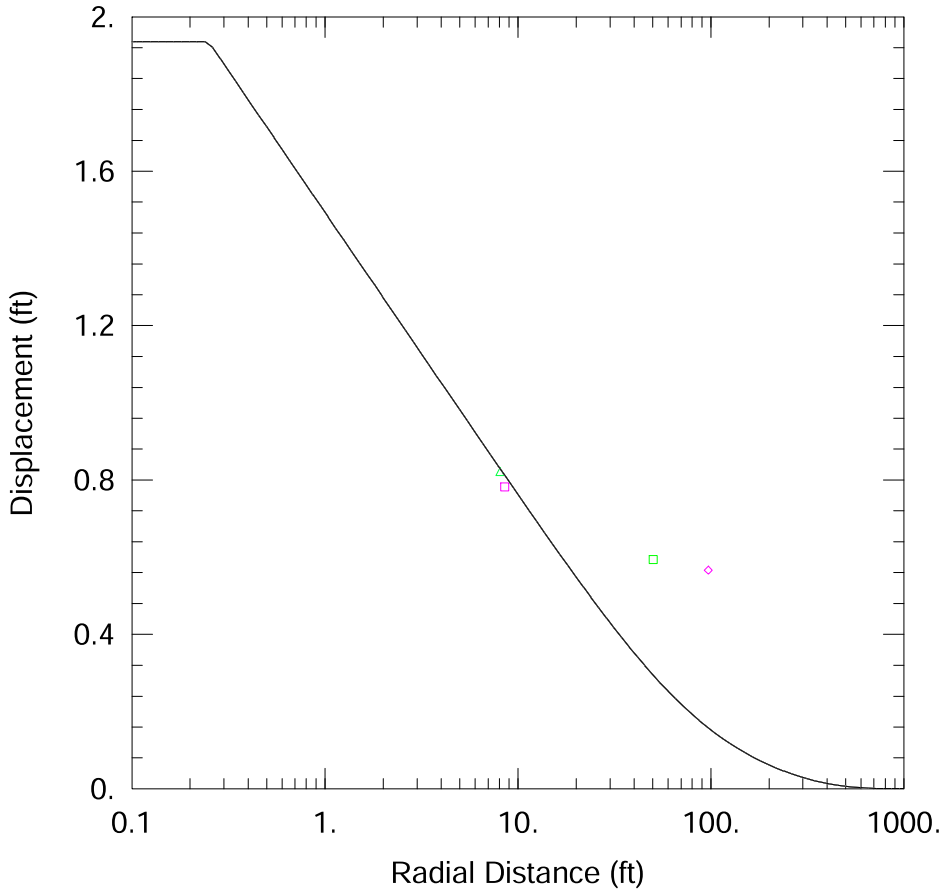
Observation Wells

Well Name	X (ft)	Y (ft)
△ PSOW-8	872101	425177
□ PSOW-10	872103	425193
□ PWOW-1	872120	425139
◇ PWOW-2	872159	425108

SOLUTION

Aquifer Model: Confined Solution Method: Dougherty-Babu

T = 1.038E+4 ft^2/day S = 0.0101
Kz/Kr = 0.1 Sw = 0.
r(w) = 0.25 ft r(c) = 0.25 ft



WELL TEST ANALYSIS

Data Set: N:\...\Distance-Drawdown_Hantush-Jacob_Step5-72min_No APT.aqt
Date: 12/11/20 Time: 16:01:08

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	872100	425185

Observation Wells

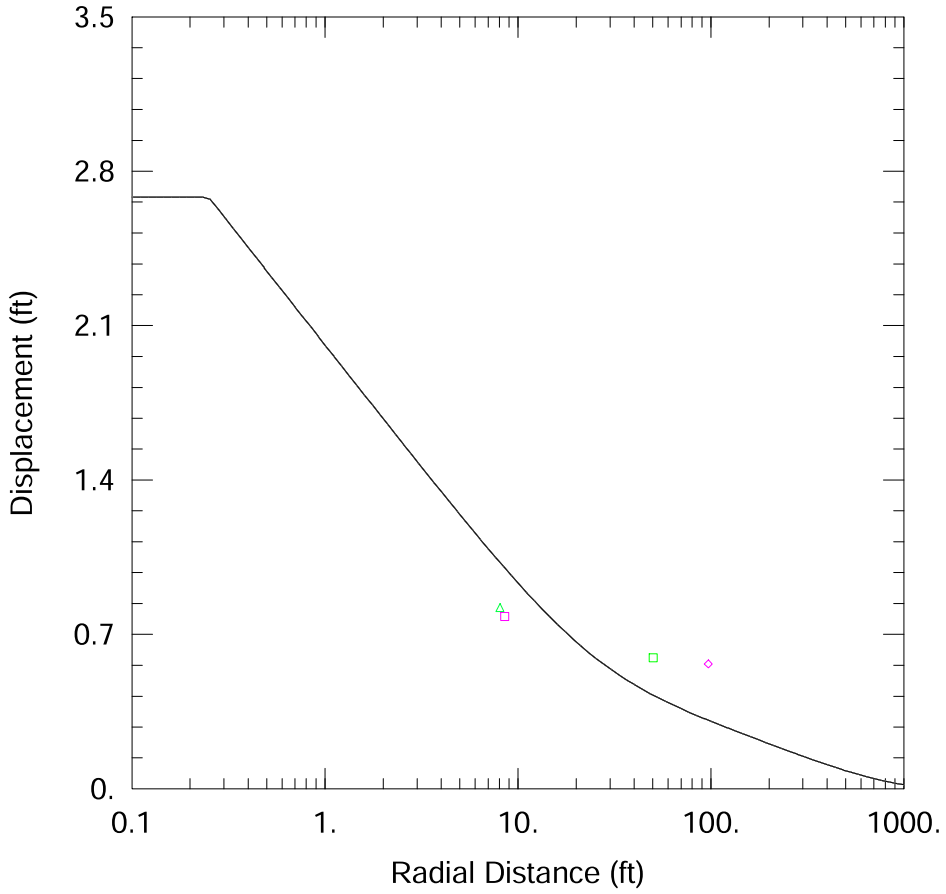
Well Name	X (ft)	Y (ft)
△ PSOW-8	872101	425177
□ PSOW-10	872103	425193
□ PWOW-1	872120	425139
◇ PWOW-2	872159	425108

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 1.093E+4 ft^2/day
1/B = 1.24E-6 ft^{-1}
b = 65. ft

S = 0.01191
Kz/Kr = 0.1



WELL TEST ANALYSIS

Data Set: N:\...\Distance-Drawdown_Theis_Step5-72min_no APT_K.aqt
Date: 01/21/21 Time: 15:13:52

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	872100	425185

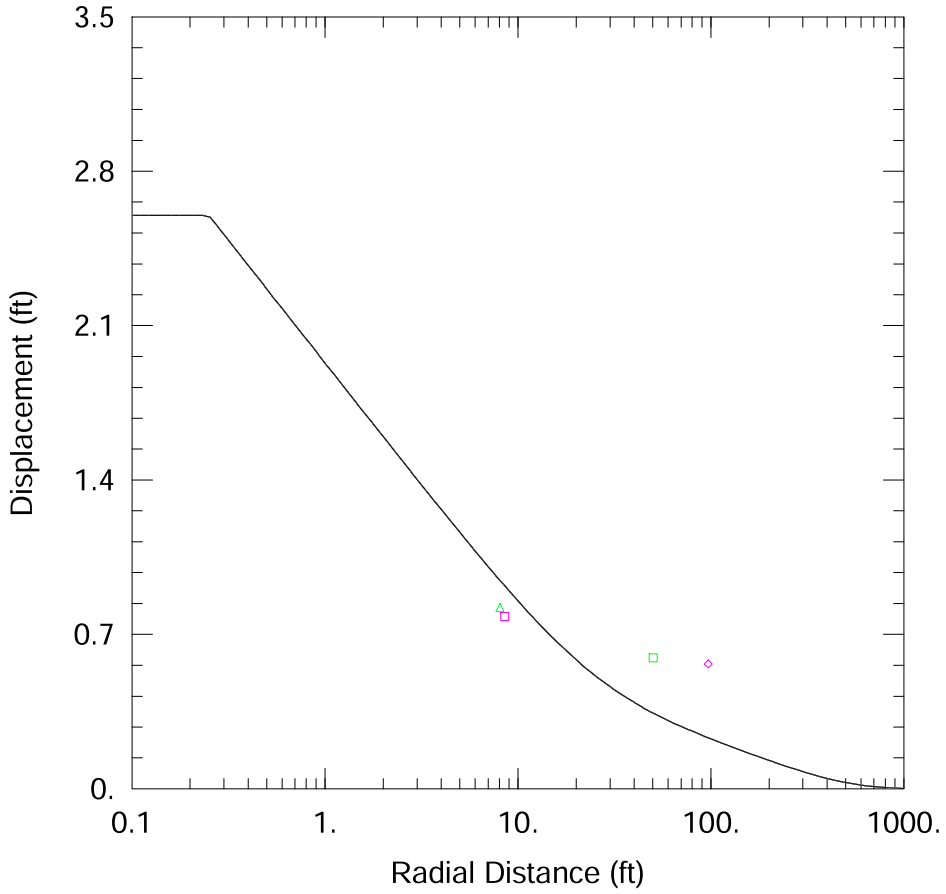
Observation Wells

Well Name	X (ft)	Y (ft)
△ PSOW-8	872101	425177
□ PSOW-10	872103	425193
□ PWOW-1	872120	425139
◇ PWOW-2	872159	425108

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 7207. ft^2/day
S = 0.001345
Kz/Kr = 1.
b = 65. ft



WELL TEST ANALYSIS

Data Set: N:\...\Distance-Drawdown_DB_Step5-72min_no APT_K.aqt
Date: 01/21/21 Time: 15:17:38

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	872100	425185

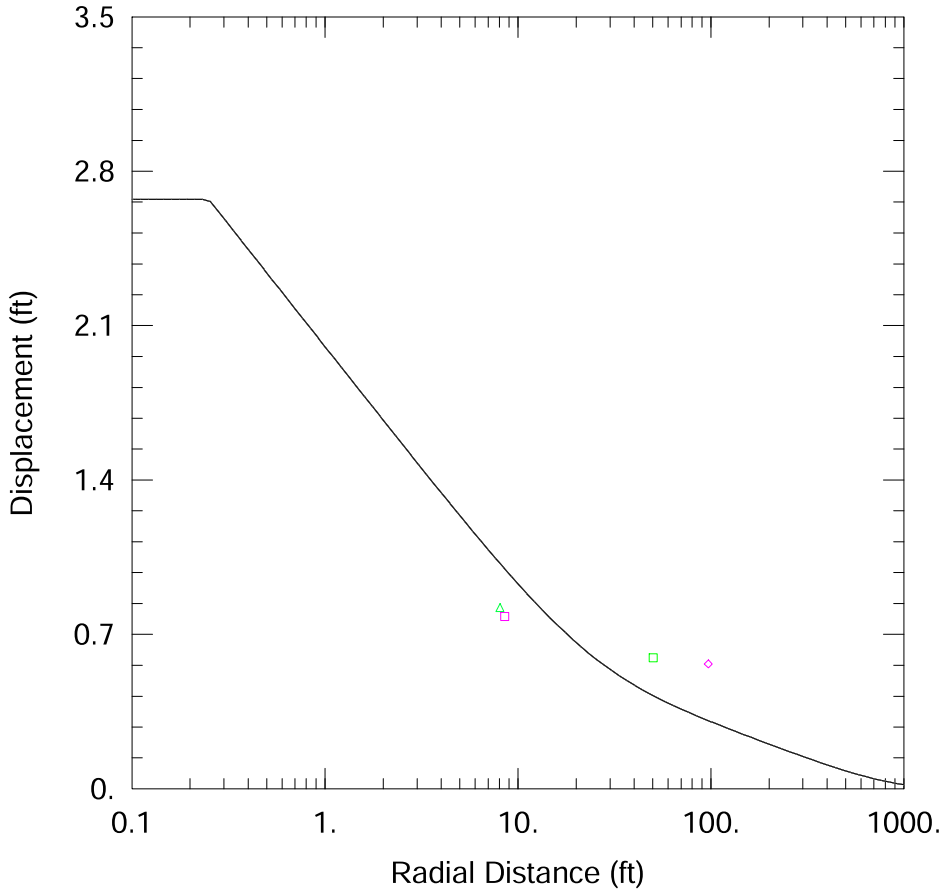
Observation Wells

Well Name	X (ft)	Y (ft)
△ PSOW-8	872101	425177
□ PSOW-10	872103	425193
□ PWOW-1	872120	425139
◇ PWOW-2	872159	425108

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 7208. ft^2/day
S = 0.004
Kz/Kr = 1.
b = 65. ft



WELL TEST ANALYSIS

Data Set: N:\...\Distance-Drawdown_HJ_Step5-72min_no APT_K.aqt
Date: 01/21/21 Time: 15:21:57

PROJECT INFORMATION

Company: Geosyntec Consultants
Client: Hercules LLC/Pinova INC
Project: GR6881C
Location: Brunswick, Georgia
Test Well: APT-1
Test Date: 03/12/2020

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
APT-1	872100	425185

Observation Wells

Well Name	X (ft)	Y (ft)
△ PSOW-8	872101	425177
□ PSOW-10	872103	425193
□ PWOW-1	872120	425139
◇ PWOW-2	872159	425108

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 7230. ft^2/day
1/B = 0.0002577 ft^{-1}
b = 65. ft

S = 0.001345
Kz/Kr = 1.

APPENDIX G

Soil Laboratory Analytical Report

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Tel: (912)354-7858

Laboratory Job ID: 680-181268-1
Client Project/Site: Ashland - Brunswick Plant Soil

For:
Geosyntec Consultants, Inc.
1255 Roberts Blvd, NW
Suite 200
Kennesaw, Georgia 30144

Attn: Adria Reimer

Authorized for release by:
3/27/2020 5:40:44 PM

Jerry Lanier, Project Manager I
(912)250-0281
jerry.lanier@testamericainc.com

Table of Contents

Job ID: 680-181268-1

Laboratory: Eurofins TestAmerica, Savannah

Narrative

CASE NARRATIVE

Client: Geosyntec Consultants, Inc.

Project: Ashland - Brunswick Plant Soil

Report Number: 680-181268-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

RECEIPT
The samples were received on 03/06/2020; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 5.6 C.

TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)
Samples IDW-1-03042020 (680-181268-5) and IDW-2-03042020 (680-181268-7) were analyzed for TCLP volatile organic compounds (GC-MS) in accordance with EPA SW-846 Methods 1311/8260B. The samples were leached on 03/11/2020 and analyzed on 03/13/2020.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 680-610865 recovered outside control limits for the following analytes: Tetrachloroethene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Refer to the QC report for details.

Samples IDW-1-03042020 (680-181268-5)[20X] and IDW-2-03042020 (680-181268-7)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 680-611064.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)
Sample TB-0103052020 (680-181268-8) was analyzed for Volatile Organic Compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 03/16/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PESTICIDES (TCLP)
Samples IDW-1-03042020 (680-181268-5) and IDW-2-03042020 (680-181268-7) were analyzed for Pesticides (TCLP) in accordance with EPA SW-846 Method 1311/8081B_8082A. The samples were leached on 03/12/2020, prepared on 03/18/2020 and analyzed on 03/21/2020.

This method incorporates 2nd column confirmation. Corrective action is not taken for surrogate/spike compounds unless results from both columns are unacceptable. Results outside criteria are qualified.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 680-181268-1 (Continued)

Laboratory: Eurofins TestAmerica, Savannah (Continued)

PERCENT SOLIDS

Samples APT-01-84-85-02272020 (680-181268-1), APT-01-94-95-02272020 (680-181268-2), APT-01-79-80-02272020 (680-181268-3), PWOW-02-86-03032020 (680-181268-4) and PWOW-02-81-03032020 (680-181268-6) were analyzed for percent solids in accordance with SM 2540G. The samples were analyzed on 03/13/2020.

Constant weight was not achieved after 3 drying cycles for the following samples: APT-01-94-95-02272020 (680-181268-2) and (680-181268-C-1 DU). The sample results have been reported.

The following sample(s) were received outside of holding time: APT-01-84-85-02272020 (680-181268-1), APT-01-94-95-02272020 (680-181268-2) and APT-01-79-80-02272020 (680-181268-3).

The following sample(s) were received with approximately half of their hold time expired snd the lab was unable to analyze the samples within hold: PWOW-02-86-03032020 (680-181268-4) and PWOW-02-81-03032020 (680-181268-6).

It was noted the Ash Content, Fixed Solids and Total Solids were detected in method blank MB 680-611175/1 at levels exceeding the reporting limit of 0.1%. Since the lab uses sand as the blank matrix it will always be reported above this limit.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GRAIN SIZE

Samples APT-01-84-85-02272020 (680-181268-1), APT-01-94-95-02272020 (680-181268-2), APT-01-79-80-02272020 (680-181268-3), PWOW-02-86-03032020 (680-181268-4) and PWOW-02-81-03032020 (680-181268-6) were analyzed for grain size in accordance with ASTM D422. The samples were analyzed on 03/12/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL ORGANIC CARBON

Samples APT-01-84-85-02272020 (680-181268-1), APT-01-94-95-02272020 (680-181268-2), APT-01-79-80-02272020 (680-181268-3), PWOW-02-86-03032020 (680-181268-4) and PWOW-02-81-03032020 (680-181268-6) were analyzed for Total Organic Carbon in accordance with Walkley Black (TOC). The samples were analyzed on 03/24/2020.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
680-181268-1	APT-01-84-85-02272020	Solid	02/27/20 11:30	03/06/20 09:15	
680-181268-2	APT-01-94-95-02272020	Solid	02/27/20 11:30	03/06/20 09:15	
680-181268-3	APT-01-79-80-02272020	Solid	02/27/20 11:30	03/06/20 09:15	
680-181268-4	PWOW-02-86-03032020	Solid	03/03/20 13:00	03/06/20 09:15	
680-181268-5	IDW-1-03042020	Solid	03/04/20 16:00	03/06/20 09:15	
680-181268-6	PWOW-02-81-03032020	Solid	03/03/20 13:00	03/06/20 09:15	
680-181268-7	IDW-2-03042020	Solid	03/04/20 16:00	03/06/20 09:15	
680-181268-8	TB-0103052020	Water	03/05/20 11:00	03/06/20 09:15	

Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SAV
8081B/8082A	Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography	SW846	TAL SAV
SM 2540G	Total, Fixed, and Volatile Solids	SM	TAL SAV
WALKLEY BLACK	Organic Carbon, Total (TOC)	MSA	TAL PEN
D422	Grain Size	ASTM	TAL BUR
1311	TCLP Extraction	SW846	TAL SAV
3520C	Liquid-Liquid Extraction (Continuous)	SW846	TAL SAV
5030B	Purge and Trap	SW846	TAL SAV

Protocol References:

ASTM = ASTM International

MSA = "Methods Of Soil Analysis, Chemical And Microbiological Properties", Part 2, 2nd Ed., 1982 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

TAL PEN = Eurofins TestAmerica, Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Definitions/Glossary

Client: Geosyntec Consultants, Inc. Job ID: 680-181268-1
Project/Site: Ashland - Brunswick Plant Soil

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
U	Indicates the analyte was analyzed for but not detected.

GC Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
H3	Sample was received and analyzed past holding time.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Client Sample ID: APT-01-84-85-02272020 — Lab Sample ID: 680-181268-1

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Fixed Solids	100	H H3	0.10		%	1		SM 2540G	Total/NA
Total Solids	92	H H3	0.10		%	1		SM 2540G	Total/NA
Total Volatile Solids	0.42	H H3	0.10		%	1		SM 2540G	Total/NA
Ash Content	100	H H3	0.10		%	1		SM 2540G	Total/NA
Total Organic Carbon	0.50		0.10		Percent	1		WALKLEY BLACK	Total/NA
Fine Sand	13.4				%	1		D422	Total/NA
Sieve Size 3 inch	0.0				%	1		D422	Total/NA
Gravel	1.5				%	1		D422	Total/NA
Sieve Size 2 inch	0.0				%	1		D422	Total/NA
Coarse Sand	7.9				%	1		D422	Total/NA
Sieve Size 1 inch	0.0				%	1		D422	Total/NA
Medium Sand	64.3				%	1		D422	Total/NA
Sieve Size 1.5 inch	0.0				%	1		D422	Total/NA
Sand	85.6				%	1		D422	Total/NA
Sieve Size 0.75 inch	0.0				%	1		D422	Total/NA
Fines	12.9				%	1		D422	Total/NA
Sieve Size 0.375 inch	0.0				%	1		D422	Total/NA
Sieve Size #4	1.5				%	1		D422	Total/NA
Sieve Size #10	7.9				%	1		D422	Total/NA
Sieve Size #20	36.3				%	1		D422	Total/NA
Sieve Size #40	28.0				%	1		D422	Total/NA
Sieve Size #60	6.0				%	1		D422	Total/NA
Sieve Size #80	2.9				%	1		D422	Total/NA
Sieve Size #100	1.9				%	1		D422	Total/NA
Sieve Size #200	2.6				%	1		D422	Total/NA

Client Sample ID: APT-01-94-95-02272020 — Lab Sample ID: 680-181268-2

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Fixed Solids	99	H H3	0.10		%	1		SM 2540G	Total/NA
Total Solids	87	H H3	0.10		%	1		SM 2540G	Total/NA
Total Volatile Solids	0.53	H H3	0.10		%	1		SM 2540G	Total/NA
Ash Content	99	H H3	0.10		%	1		SM 2540G	Total/NA
Total Organic Carbon	0.18		0.10		Percent	1		WALKLEY BLACK	Total/NA
Fine Sand	13.2				%	1		D422	Total/NA
Sieve Size 3 inch	0.0				%	1		D422	Total/NA
Gravel	0.9				%	1		D422	Total/NA
Sieve Size 2 inch	0.0				%	1		D422	Total/NA
Coarse Sand	7.7				%	1		D422	Total/NA
Sieve Size 1 inch	0.0				%	1		D422	Total/NA
Medium Sand	67.6				%	1		D422	Total/NA
Sieve Size 1.5 inch	0.0				%	1		D422	Total/NA
Sand	88.5				%	1		D422	Total/NA
Sieve Size 0.75 inch	0.0				%	1		D422	Total/NA
Fines	10.6				%	1		D422	Total/NA
Sieve Size 0.375 inch	0.0				%	1		D422	Total/NA
Sieve Size #4	0.9				%	1		D422	Total/NA
Sieve Size #10	7.7				%	1		D422	Total/NA
Sieve Size #20	40.7				%	1		D422	Total/NA
Sieve Size #40	26.9				%	1		D422	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: APT-01-94-95-02272020 (Continued)

Lab Sample ID: 680-181268-2

Analyte	Result	Qualifier	NONE	NONE	Unit	Dil Fac	D	Method	Prep Type
Sieve Size #60	5.9				%	1		D422	Total/NA
Sieve Size #80	2.9				%	1		D422	Total/NA
Sieve Size #100	1.7				%	1		D422	Total/NA
Sieve Size #200	2.7				%	1		D422	Total/NA

Client Sample ID: APT-01-79-80-02272020

Lab Sample ID: 680-181268-3

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Fixed Solids	99	H H3	0.10		%	1		SM 2540G	Total/NA
Total Solids	86	H H3	0.10		%	1		SM 2540G	Total/NA
Total Volatile Solids	1.2	H H3	0.10		%	1		SM 2540G	Total/NA
Ash Content	100	H H3	0.10		%	1		SM 2540G	Total/NA
Total Organic Carbon	0.34		0.10		Percent	1		WALKLEY BLACK	Total/NA
Fine Sand	17.4				%	1		D422	Total/NA
Sieve Size 3 inch	0.0				%	1		D422	Total/NA
Gravel	1.2				%	1		D422	Total/NA
Sieve Size 2 inch	0.0				%	1		D422	Total/NA
Coarse Sand	10.8				%	1		D422	Total/NA
Sieve Size 1 inch	0.0				%	1		D422	Total/NA
Medium Sand	62.3				%	1		D422	Total/NA
Sieve Size 1.5 inch	0.0				%	1		D422	Total/NA
Sand	90.5				%	1		D422	Total/NA
Sieve Size 0.75 inch	0.0				%	1		D422	Total/NA
Fines	8.3				%	1		D422	Total/NA
Sieve Size 0.375 inch	0.0				%	1		D422	Total/NA
Sieve Size #4	1.2				%	1		D422	Total/NA
Sieve Size #10	10.8				%	1		D422	Total/NA
Sieve Size #20	33.4				%	1		D422	Total/NA
Sieve Size #40	28.9				%	1		D422	Total/NA
Sieve Size #60	6.1				%	1		D422	Total/NA
Sieve Size #80	5.1				%	1		D422	Total/NA
Sieve Size #100	2.8				%	1		D422	Total/NA
Sieve Size #200	3.4				%	1		D422	Total/NA

Client Sample ID: PWOW-02-86-03032020

Lab Sample ID: 680-181268-4

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Fixed Solids	99	H	0.10		%	1		SM 2540G	Total/NA
Total Solids	92	H	0.10		%	1		SM 2540G	Total/NA
Total Volatile Solids	0.76	H	0.10		%	1		SM 2540G	Total/NA
Ash Content	99	H	0.10		%	1		SM 2540G	Total/NA
Total Organic Carbon	0.22		0.10		Percent	1		WALKLEY BLACK	Total/NA
Fine Sand	15.8				%	1		D422	Total/NA
Sieve Size 3 inch	0.0				%	1		D422	Total/NA
Gravel	2.0				%	1		D422	Total/NA
Sieve Size 2 inch	0.0				%	1		D422	Total/NA
Coarse Sand	7.6				%	1		D422	Total/NA
Sieve Size 1 inch	0.0				%	1		D422	Total/NA
Medium Sand	66.0				%	1		D422	Total/NA
Sieve Size 1.5 inch	0.0				%	1		D422	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: PWOW-02-86-03032020 (Continued) — Lab Sample ID: 680-181268-4

Analyte	Result	Qualifier	NONE	NONE	Unit	Dil Fac	D	Method	Prep Type
Sand	89.4				%	1		D422	Total/NA
Sieve Size 0.75 inch	0.0				%	1		D422	Total/NA
Fines	8.7				%	1		D422	Total/NA
Sieve Size 0.375 inch	0.0				%	1		D422	Total/NA
Sieve Size #4	2.0				%	1		D422	Total/NA
Sieve Size #10	7.6				%	1		D422	Total/NA
Sieve Size #20	41.0				%	1		D422	Total/NA
Sieve Size #40	25.0				%	1		D422	Total/NA
Sieve Size #60	7.3				%	1		D422	Total/NA
Sieve Size #80	3.1				%	1		D422	Total/NA
Sieve Size #100	2.4				%	1		D422	Total/NA
Sieve Size #200	2.9				%	1		D422	Total/NA

Client Sample ID: IDW-1-03042020 — Lab Sample ID: 680-181268-5

No Detections.

Client Sample ID: PWOW-02-81-03032020 — Lab Sample ID: 680-181268-6

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
Fixed Solids	99	H	0.10		%	1		SM 2540G	Total/NA
Total Solids	95	H	0.10		%	1		SM 2540G	Total/NA
Total Volatile Solids	0.72	H	0.10		%	1		SM 2540G	Total/NA
Ash Content	99	H	0.10		%	1		SM 2540G	Total/NA
Total Organic Carbon	0.28		0.10		Percent	1		WALKLEY BLACK	Total/NA
Fine Sand	9.2				%	1		D422	Total/NA
Sieve Size 3 inch	0.0				%	1		D422	Total/NA
Gravel	1.1				%	1		D422	Total/NA
Sieve Size 2 inch	0.0				%	1		D422	Total/NA
Coarse Sand	8.2				%	1		D422	Total/NA
Sieve Size 1 inch	0.0				%	1		D422	Total/NA
Medium Sand	71.8				%	1		D422	Total/NA
Sieve Size 1.5 inch	0.0				%	1		D422	Total/NA
Sand	89.2				%	1		D422	Total/NA
Sieve Size 0.75 inch	0.0				%	1		D422	Total/NA
Fines	9.7				%	1		D422	Total/NA
Sieve Size 0.375 inch	0.0				%	1		D422	Total/NA
Sieve Size #4	1.1				%	1		D422	Total/NA
Sieve Size #10	8.2				%	1		D422	Total/NA
Sieve Size #20	49.2				%	1		D422	Total/NA
Sieve Size #40	22.6				%	1		D422	Total/NA
Sieve Size #60	4.0				%	1		D422	Total/NA
Sieve Size #80	2.1				%	1		D422	Total/NA
Sieve Size #100	1.2				%	1		D422	Total/NA
Sieve Size #200	1.9				%	1		D422	Total/NA

Client Sample ID: IDW-2-03042020 — Lab Sample ID: 680-181268-7

No Detections.

Client Sample ID: TB-0103052020 — Lab Sample ID: 680-181268-8

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Geosyntec Consultants, Inc.
Job ID: 680-181268-1
Project/Site: Ashland - Brunswick Plant Soil

Client Sample ID: APT-01-84-85-02272020
Lab Sample ID: 680-181268-1
Date Collected: 02/27/20 11:30
Matrix: Solid
Date Received: 03/06/20 09:15

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.50		0.10		Percent			03/24/20 08:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fixed Solids	100	H H3	0.10		%			03/13/20 15:55	1
Total Solids	92	H H3	0.10		%			03/13/20 15:55	1
Total Volatile Solids	0.42	H H3	0.10		%			03/13/20 15:55	1
Ash Content	100	H H3	0.10		%			03/13/20 15:55	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Fine Sand	13.4				%			03/12/20 10:37	1
Sieve Size 3 inch	0.0				%			03/12/20 10:37	1
Gravel	1.5				%			03/12/20 10:37	1
Sieve Size 2 inch	0.0				%			03/12/20 10:37	1
Coarse Sand	7.9				%			03/12/20 10:37	1
Sieve Size 1 inch	0.0				%			03/12/20 10:37	1
Medium Sand	64.3				%			03/12/20 10:37	1
Sieve Size 1.5 inch	0.0				%			03/12/20 10:37	1
Sand	85.6				%			03/12/20 10:37	1
Sieve Size 0.75 inch	0.0				%			03/12/20 10:37	1
Fines	12.9				%			03/12/20 10:37	1
Sieve Size 0.375 inch	0.0				%			03/12/20 10:37	1
Sieve Size #4	1.5				%			03/12/20 10:37	1
Sieve Size #10	7.9				%			03/12/20 10:37	1
Sieve Size #20	36.3				%			03/12/20 10:37	1
Sieve Size #40	28.0				%			03/12/20 10:37	1
Sieve Size #60	6.0				%			03/12/20 10:37	1
Sieve Size #80	2.9				%			03/12/20 10:37	1
Sieve Size #100	1.9				%			03/12/20 10:37	1
Sieve Size #200	2.6				%			03/12/20 10:37	1

Client: Geosyntec Consultants, Inc.
Job ID: 680-181268-1
Project/Site: Ashland - Brunswick Plant Soil

Client Sample ID: APT-01-94-95-02272020
Lab Sample ID: 680-181268-2
Date Collected: 02/27/20 11:30
Matrix: Solid
Date Received: 03/06/20 09:15

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.18		0.10		Percent			03/24/20 08:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fixed Solids	99	H H3	0.10		%			03/13/20 15:55	1
Total Solids	87	H H3	0.10		%			03/13/20 15:55	1
Total Volatile Solids	0.53	H H3	0.10		%			03/13/20 15:55	1
Ash Content	99	H H3	0.10		%			03/13/20 15:55	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Fine Sand	13.2				%			03/12/20 10:40	1
Sieve Size 3 inch	0.0				%			03/12/20 10:40	1
Gravel	0.9				%			03/12/20 10:40	1
Sieve Size 2 inch	0.0				%			03/12/20 10:40	1
Coarse Sand	7.7				%			03/12/20 10:40	1
Sieve Size 1 inch	0.0				%			03/12/20 10:40	1
Medium Sand	67.6				%			03/12/20 10:40	1
Sieve Size 1.5 inch	0.0				%			03/12/20 10:40	1
Sand	88.5				%			03/12/20 10:40	1
Sieve Size 0.75 inch	0.0				%			03/12/20 10:40	1
Fines	10.6				%			03/12/20 10:40	1
Sieve Size 0.375 inch	0.0				%			03/12/20 10:40	1
Sieve Size #4	0.9				%			03/12/20 10:40	1
Sieve Size #10	7.7				%			03/12/20 10:40	1
Sieve Size #20	40.7				%			03/12/20 10:40	1
Sieve Size #40	26.9				%			03/12/20 10:40	1
Sieve Size #60	5.9				%			03/12/20 10:40	1
Sieve Size #80	2.9				%			03/12/20 10:40	1
Sieve Size #100	1.7				%			03/12/20 10:40	1
Sieve Size #200	2.7				%			03/12/20 10:40	1

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Client Sample ID: APT-01-79-80-02272020
Date Collected: 02/27/20 11:30
Date Received: 03/06/20 09:15

Lab Sample ID: 680-181268-3
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.34		0.10		Percent			03/24/20 08:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fixed Solids	99	H H3	0.10		%			03/13/20 15:55	1
Total Solids	86	H H3	0.10		%			03/13/20 15:55	1
Total Volatile Solids	1.2	H H3	0.10		%			03/13/20 15:55	1
Ash Content	100	H H3	0.10		%			03/13/20 15:55	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Fine Sand	17.4				%			03/12/20 10:42	1
Sieve Size 3 inch	0.0				%			03/12/20 10:42	1
Gravel	1.2				%			03/12/20 10:42	1
Sieve Size 2 inch	0.0				%			03/12/20 10:42	1
Coarse Sand	10.8				%			03/12/20 10:42	1
Sieve Size 1 inch	0.0				%			03/12/20 10:42	1
Medium Sand	62.3				%			03/12/20 10:42	1
Sieve Size 1.5 inch	0.0				%			03/12/20 10:42	1
Sand	90.5				%			03/12/20 10:42	1
Sieve Size 0.75 inch	0.0				%			03/12/20 10:42	1
Fines	8.3				%			03/12/20 10:42	1
Sieve Size 0.375 inch	0.0				%			03/12/20 10:42	1
Sieve Size #4	1.2				%			03/12/20 10:42	1
Sieve Size #10	10.8				%			03/12/20 10:42	1
Sieve Size #20	33.4				%			03/12/20 10:42	1
Sieve Size #40	28.9				%			03/12/20 10:42	1
Sieve Size #60	6.1				%			03/12/20 10:42	1
Sieve Size #80	5.1				%			03/12/20 10:42	1
Sieve Size #100	2.8				%			03/12/20 10:42	1
Sieve Size #200	3.4				%			03/12/20 10:42	1

Client: Geosyntec Consultants, Inc.
Job ID: 680-181268-1
Project/Site: Ashland - Brunswick Plant Soil

Client Sample ID: PWOW-02-86-03032020
Lab Sample ID: 680-181268-4
Date Collected: 03/03/20 13:00
Matrix: Solid
Date Received: 03/06/20 09:15

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.22		0.10		Percent			03/24/20 08:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fixed Solids	99	H	0.10		%			03/13/20 15:55	1
Total Solids	92	H	0.10		%			03/13/20 15:55	1
Total Volatile Solids	0.76	H	0.10		%			03/13/20 15:55	1
Ash Content	99	H	0.10		%			03/13/20 15:55	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Fine Sand	15.8				%			03/12/20 10:44	1
Sieve Size 3 inch	0.0				%			03/12/20 10:44	1
Gravel	2.0				%			03/12/20 10:44	1
Sieve Size 2 inch	0.0				%			03/12/20 10:44	1
Coarse Sand	7.6				%			03/12/20 10:44	1
Sieve Size 1 inch	0.0				%			03/12/20 10:44	1
Medium Sand	66.0				%			03/12/20 10:44	1
Sieve Size 1.5 inch	0.0				%			03/12/20 10:44	1
Sand	89.4				%			03/12/20 10:44	1
Sieve Size 0.75 inch	0.0				%			03/12/20 10:44	1
Fines	8.7				%			03/12/20 10:44	1
Sieve Size 0.375 inch	0.0				%			03/12/20 10:44	1
Sieve Size #4	2.0				%			03/12/20 10:44	1
Sieve Size #10	7.6				%			03/12/20 10:44	1
Sieve Size #20	41.0				%			03/12/20 10:44	1
Sieve Size #40	25.0				%			03/12/20 10:44	1
Sieve Size #60	7.3				%			03/12/20 10:44	1
Sieve Size #80	3.1				%			03/12/20 10:44	1
Sieve Size #100	2.4				%			03/12/20 10:44	1
Sieve Size #200	2.9				%			03/12/20 10:44	1

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Client Sample ID: IDW-1-03042020
Date Collected: 03/04/20 16:00
Date Received: 03/06/20 09:15

Lab Sample ID: 680-181268-5
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.020	U	0.020		mg/L			03/13/20 17:12	20
2-Butanone (MEK)	0.20	U	0.20		mg/L			03/13/20 17:12	20
Carbon tetrachloride	0.020	U	0.020		mg/L			03/13/20 17:12	20
Chlorobenzene	0.020	U	0.020		mg/L			03/13/20 17:12	20
Chloroform	0.020	U	0.020		mg/L			03/13/20 17:12	20
1,4-Dichlorobenzene	0.020	U	0.020		mg/L			03/13/20 17:12	20
1,2-Dichloroethane	0.020	U	0.020		mg/L			03/13/20 17:12	20
1,1-Dichloroethene	0.020	U	0.020		mg/L			03/13/20 17:12	20
Tetrachloroethene	0.020	U *	0.020		mg/L			03/13/20 17:12	20
Trichloroethene	0.020	U	0.020		mg/L			03/13/20 17:12	20
Vinyl chloride	0.020	U	0.020		mg/L			03/13/20 17:12	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*87*		*80 - 120*		*03/13/20 17:12*	*20*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*03/13/20 17:12*	*20*
1,2-Dichloroethane-d4 (Surr)	*102*		*73 - 131*		*03/13/20 17:12*	*20*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/20 17:12*	*20*

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	0.012	U	0.012		mg/L		03/18/20 18:08	03/21/20 23:36	1
Endrin	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:36	1
gamma-BHC (Lindane)	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:36	1
Heptachlor	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:36	1
Heptachlor epoxide	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:36	1
Methoxychlor	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:36	1
Toxaphene	0.12	U	0.12		mg/L		03/18/20 18:08	03/21/20 23:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*97*		*14 - 130*	*03/18/20 18:08*	*03/21/20 23:36*	*1*
Tetrachloro-m-xylene	*91*		*40 - 130*	*03/18/20 18:08*	*03/21/20 23:36*	*1*

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Client Sample ID: PWOW-02-81-03032020
Date Collected: 03/03/20 13:00
Date Received: 03/06/20 09:15

Lab Sample ID: 680-181268-6
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.28		0.10		Percent			03/24/20 12:21	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fixed Solids	99	H	0.10		%			03/13/20 15:55	1
Total Solids	95	H	0.10		%			03/13/20 15:55	1
Total Volatile Solids	0.72	H	0.10		%			03/13/20 15:55	1
Ash Content	99	H	0.10		%			03/13/20 15:55	1

Method: D422 - Grain Size

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Fine Sand	9.2				%			03/12/20 10:47	1
Sieve Size 3 inch	0.0				%			03/12/20 10:47	1
Gravel	1.1				%			03/12/20 10:47	1
Sieve Size 2 inch	0.0				%			03/12/20 10:47	1
Coarse Sand	8.2				%			03/12/20 10:47	1
Sieve Size 1 inch	0.0				%			03/12/20 10:47	1
Medium Sand	71.8				%			03/12/20 10:47	1
Sieve Size 1.5 inch	0.0				%			03/12/20 10:47	1
Sand	89.2				%			03/12/20 10:47	1
Sieve Size 0.75 inch	0.0				%			03/12/20 10:47	1
Fines	9.7				%			03/12/20 10:47	1
Sieve Size 0.375 inch	0.0				%			03/12/20 10:47	1
Sieve Size #4	1.1				%			03/12/20 10:47	1
Sieve Size #10	8.2				%			03/12/20 10:47	1
Sieve Size #20	49.2				%			03/12/20 10:47	1
Sieve Size #40	22.6				%			03/12/20 10:47	1
Sieve Size #60	4.0				%			03/12/20 10:47	1
Sieve Size #80	2.1				%			03/12/20 10:47	1
Sieve Size #100	1.2				%			03/12/20 10:47	1
Sieve Size #200	1.9				%			03/12/20 10:47	1

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Client Sample ID: IDW-2-03042020
Date Collected: 03/04/20 16:00
Date Received: 03/06/20 09:15

Lab Sample ID: 680-181268-7
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.020	U	0.020		mg/L			03/13/20 17:36	20
2-Butanone (MEK)	0.20	U	0.20		mg/L			03/13/20 17:36	20
Carbon tetrachloride	0.020	U	0.020		mg/L			03/13/20 17:36	20
Chlorobenzene	0.020	U	0.020		mg/L			03/13/20 17:36	20
Chloroform	0.020	U	0.020		mg/L			03/13/20 17:36	20
1,4-Dichlorobenzene	0.020	U	0.020		mg/L			03/13/20 17:36	20
1,2-Dichloroethane	0.020	U	0.020		mg/L			03/13/20 17:36	20
1,1-Dichloroethene	0.020	U	0.020		mg/L			03/13/20 17:36	20
Tetrachloroethene	0.020	U *	0.020		mg/L			03/13/20 17:36	20
Trichloroethene	0.020	U	0.020		mg/L			03/13/20 17:36	20
Vinyl chloride	0.020	U	0.020		mg/L			03/13/20 17:36	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*80 - 120*		*03/13/20 17:36*	*20*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*03/13/20 17:36*	*20*
1,2-Dichloroethane-d4 (Surr)	*102*		*73 - 131*		*03/13/20 17:36*	*20*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/20 17:36*	*20*

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	0.012	U	0.012		mg/L		03/18/20 18:08	03/21/20 23:50	1
Endrin	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:50	1
gamma-BHC (Lindane)	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:50	1
Heptachlor	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:50	1
Heptachlor epoxide	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:50	1
Methoxychlor	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/21/20 23:50	1
Toxaphene	0.12	U	0.12		mg/L		03/18/20 18:08	03/21/20 23:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*104*		*14 - 130*	*03/18/20 18:08*	*03/21/20 23:50*	*1*
Tetrachloro-m-xylene	*87*		*40 - 130*	*03/18/20 18:08*	*03/21/20 23:50*	*1*

Client: Geosyntec Consultants, Inc.
Job ID: 680-181268-1
Project/Site: Ashland - Brunswick Plant Soil

Client Sample ID: TB-0103052020
Lab Sample ID: 680-181268-8

Date Collected: 03/05/20 11:00
Matrix: Water
Date Received: 03/06/20 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	1.0	U	1.0		ug/L			03/16/20 18:53	1
p-Cymene	1.0	U	1.0		ug/L			03/16/20 18:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*73 - 131*		*03/16/20 18:53*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/16/20 18:53*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 122*		*03/16/20 18:53*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/16/20 18:53*	*1*

Particle Size of Soils by ASTM D422

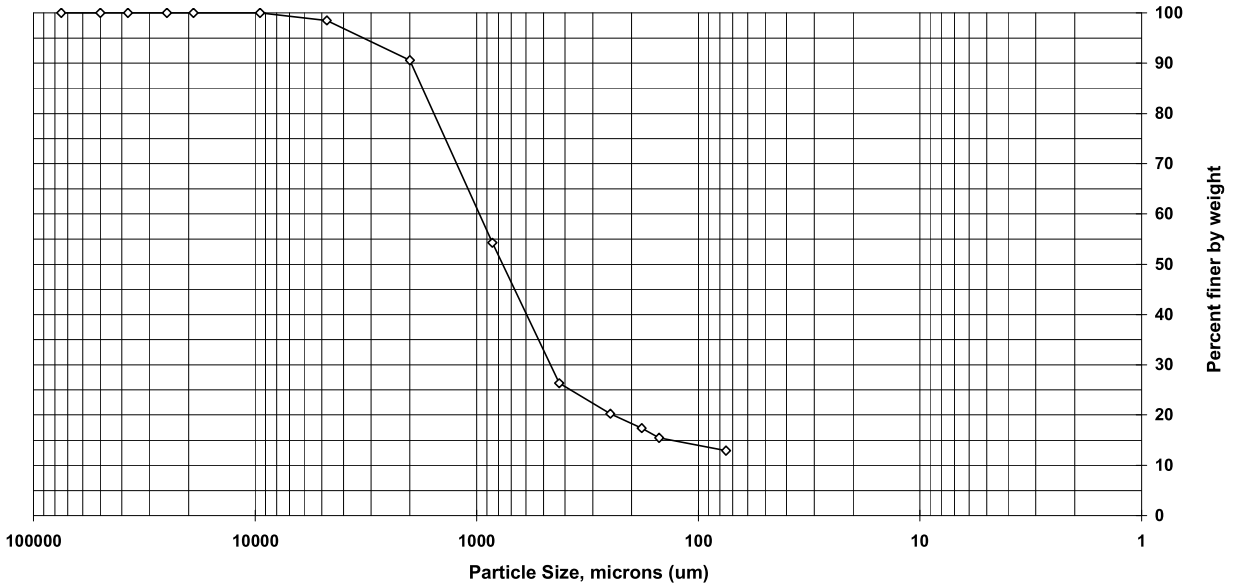
Sample ID: APT-01-84-85-0227202
Lab ID: 680-181268-A-1

Percent Solids: 89.3%
Specific Gravity: 2.650

Date Received: 3/6/2020
Start Date: 3/12/2020
End Date: 3/16/2020

Shape (> #10): angular

Non-soil material: na
Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	98.5	1.5
#10	2000	90.6	7.9
#20	850	54.3	36.3
#40	425	26.3	28.0
#60	250	20.3	6.0
#80	180	17.4	2.9
#100	150	15.5	1.9
#200	75	12.9	2.6

Soil Classification	Percent of sample
Gravel	1.5
Sand	85.6
Coarse Sand	7.9
Medium Sand	64.3
Fine Sand	13.4
Fines	12.9

Particle Size of Soils by ASTM D422

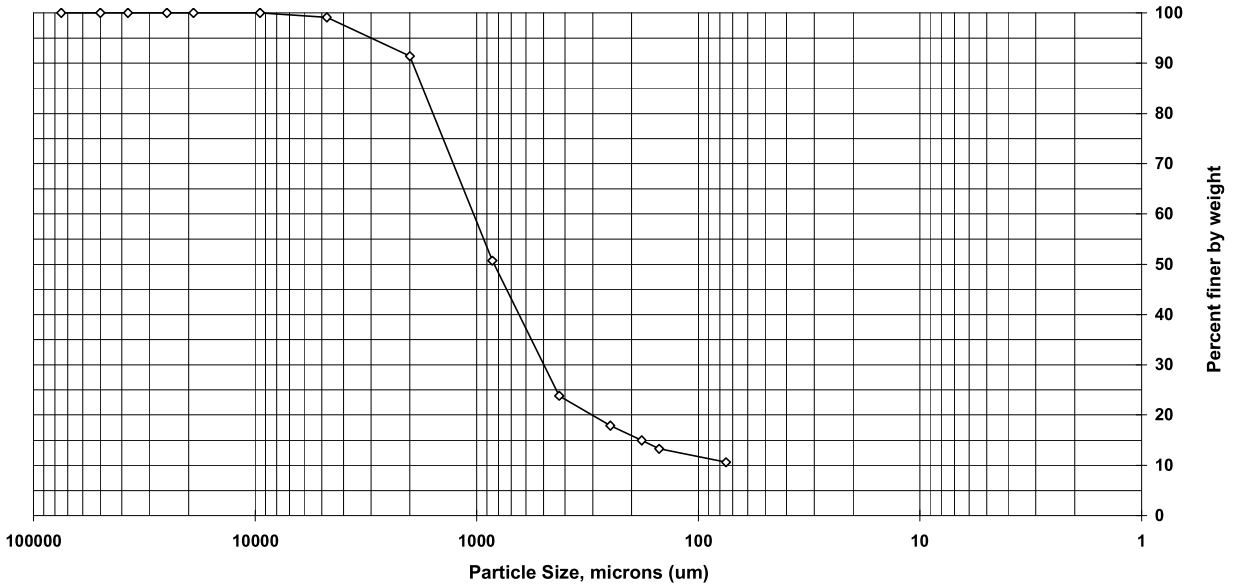
Sample ID: APT-01-94-95-0227202
Lab ID: 680-181268-A-2

Percent Solids: 91.7%
Specific Gravity: 2.650

Date Received: 3/6/2020
Start Date: 3/12/2020
End Date: 3/16/2020

Shape (> #10): angular

Non-soil material: glass
Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	99.1	0.9
#10	2000	91.4	7.7
#20	850	50.7	40.7
#40	425	23.8	26.9
#60	250	17.9	5.9
#80	180	15.0	2.9
#100	150	13.3	1.7
#200	75	10.6	2.7

Soil Classification	Percent of sample
Gravel	0.9
Sand	88.5
Coarse Sand	7.7
Medium Sand	67.6
Fine Sand	13.2
Fines	10.6

Particle Size of Soils by ASTM D422

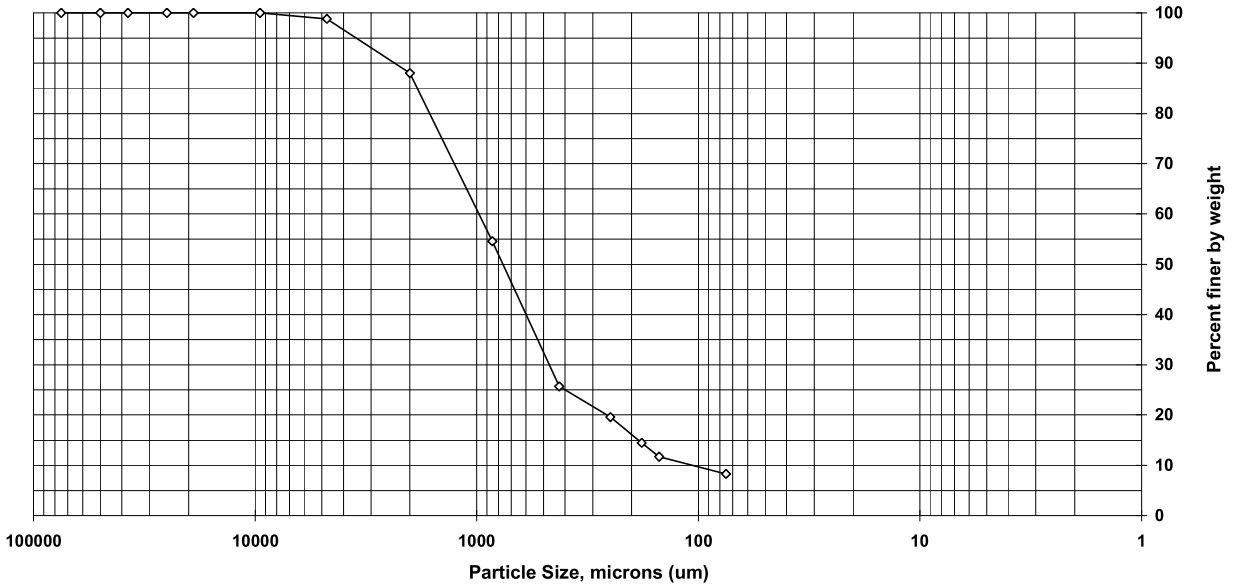
Sample ID: APT-01-79-80-0227202
Lab ID: 680-181268-A-3

Percent Solids: 89.0%
Specific Gravity: 2.650

Date Received: 3/6/2020
Start Date: 3/12/2020
End Date: 3/16/2020

Shape (> #10): angular

Non-soil material: na
Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	98.8	1.2
#10	2000	88.0	10.8
#20	850	54.6	33.4
#40	425	25.7	28.9
#60	250	19.6	6.1
#80	180	14.5	5.1
#100	150	11.7	2.8
#200	75	8.3	3.4

Soil Classification	Percent of sample
Gravel	1.2
Sand	90.5
Coarse Sand	10.8
Medium Sand	62.3
Fine Sand	17.4
Fines	8.3

Particle Size of Soils by ASTM D422

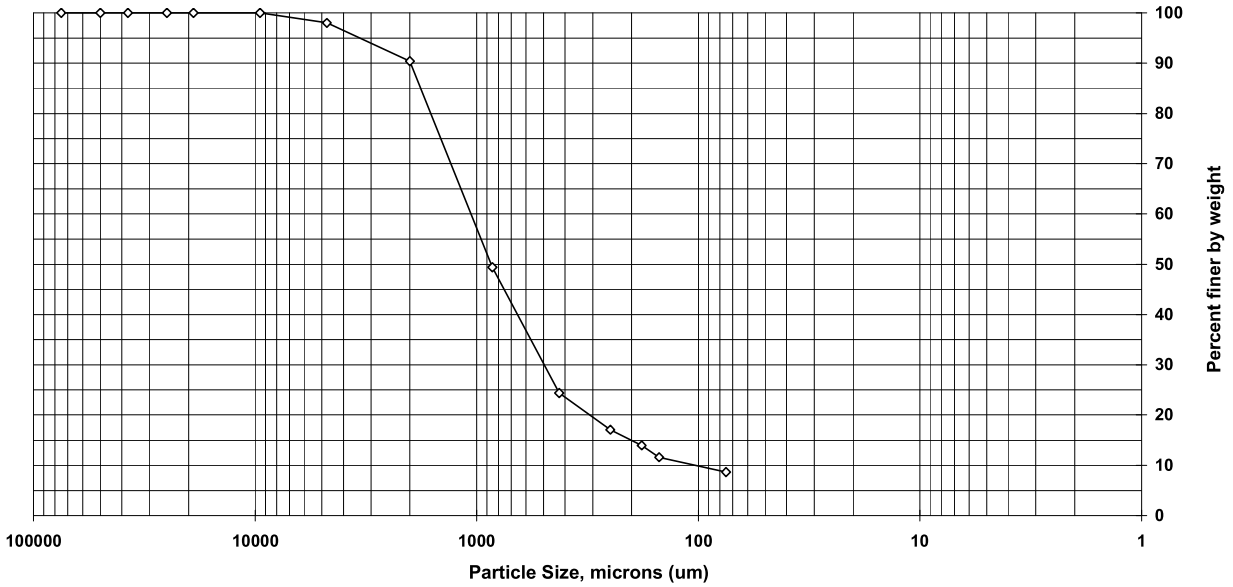
Sample ID: PWOW-02-86-03032020
Lab ID: 680-181268-A-4

Percent Solids: 91.4%
Specific Gravity: 2.650

Date Received: 3/6/2020
Start Date: 3/12/2020
End Date: 3/16/2020

Shape (> #10): angular

Non-soil material: na
Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	98.0	2.0
#10	2000	90.4	7.6
#20	850	49.4	41.0
#40	425	24.4	25.0
#60	250	17.1	7.3
#80	180	14.0	3.1
#100	150	11.6	2.4
#200	75	8.7	2.9

Soil Classification	Percent of sample
Gravel	2.0
Sand	89.4
Coarse Sand	7.6
Medium Sand	66.0
Fine Sand	15.8
Fines	8.7

Particle Size of Soils by ASTM D422

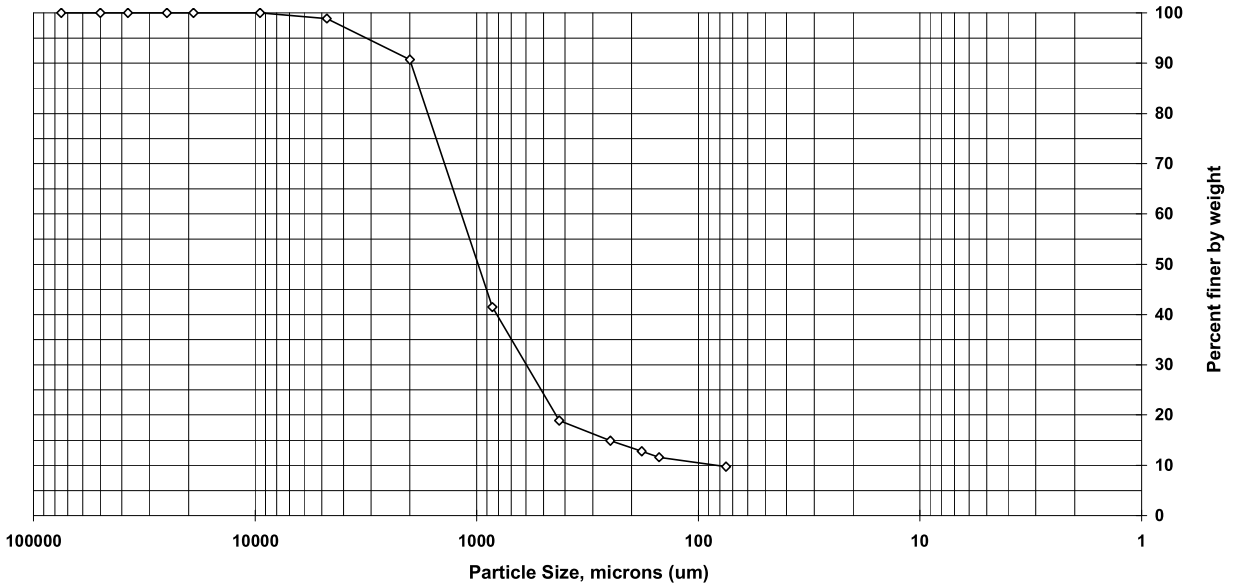
Sample ID: PWOW-02-81-03032020
Lab ID: 680-181268-A-6

Percent Solids: 89.3%
Specific Gravity: 2.650

Date Received: 3/6/2020
Start Date: 3/12/2020
End Date: 3/16/2020

Shape (> #10): angular

Non-soil material: na
Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	98.9	1.1
#10	2000	90.7	8.2
#20	850	41.5	49.2
#40	425	18.9	22.6
#60	250	14.9	4.0
#80	180	12.8	2.1
#100	150	11.6	1.2
#200	75	9.7	1.9

Soil Classification	Percent of sample
Gravel	1.1
Sand	89.2
Coarse Sand	8.2
Medium Sand	71.8
Fine Sand	9.2
Fines	9.7

Sediment Grain Size - D422

Client	
Client Sample ID	APT-01-84-85-0227202
Lab Sample ID	680-181268-A-1

Date Received	3/6/2020
Start Date	03/12/2020 10:37
End Date	03/16/2020 10:04

Dry Weight Determination

Tin Weight	1.00	g
Wet Sample + Tin	26.92	g
Dry Sample + Tin	24.15	g
% Moisture	10.69	%

Non-soil material:	na
Shape (> #10):	angular
Hardness (> #10):	hard

Date/Time in oven	03/12/2020 10:37
Date/Time out of oven	03/13/2020 6:46

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.07	211.33	167.26
Sample Weight (Oven Dried)			149

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			14
Sample <#10			135
% Passing #10			80.7

Hydrometer Data

Serial Number	
Calib. Date (mm/dd/yyyy)	
Low Temp (C)	
Reading at Low Temp	
High Temp (C)	
Reading at High Temp	
Hydrometer Cal Slope	#DIV/0!
Hydrometer Cal Intercept	#DIV/0!
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample	% Finer	Classification	Sub Class
3 inch	75000			0.00 g	100.0	Gravel	
2 inch	50000			0.00 g	100.0	Gravel	
1.5 inch	37500			0.00 g	100.0	Gravel	
1 inch	25000			0.00 g	100.0	Gravel	
3/4 inch	19000			0.00 g	100.0	Gravel	
3/8 inch	9500			0.00 g	100.0	Gravel	
#4	4750	487.90	490.10	2.20 g	98.5	Gravel	
#10	2000	462.54	474.38	11.84 g	90.6	Sand	Coarse
#20	850	378.32	432.36	54.04 g	54.3	Sand	Medium
#40	425	366.48	408.14	41.66 g	26.3	Sand	Medium
#60	250	348.07	357.04	8.97 g	20.3	Sand	Fine
#80	180	337.81	342.20	4.39 g	17.4	Sand	Fine
#100	150	328.12	330.89	2.77 g	15.5	Sand	Fine
#200	75	312.57	316.37	3.80 g	12.9	Sand	Fine
				0.00 g	12.9		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	149

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2						Silt	
5						Silt	
15						Silt	
30						Silt	
60						Silt	
250						Clay	
1440						Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	APT-01-94-95-0227202
Lab Sample ID	680-181268-A-2

Date Received	3/6/2020
Start Date	03/12/2020 10:40
End Date	03/16/2020 10:16

Dry Weight Determination

Tin Weight	1.00	g
Wet Sample + Tin	32.12	g
Dry Sample + Tin	29.53	g
% Moisture	8.32	%

Non-soil material:	glass
Shape (> #10):	angular
Hardness (> #10):	hard

Date/Time in oven	03/12/2020 10:40
Date/Time out of oven	03/13/2020 6:45

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.03	195.36	151.33
Sample Weight (Oven Dried)			139

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			11.9
Sample <#10			127
% Passing #10			83.9

Hydrometer Data

Serial Number	
Calib. Date (mm/dd/yyyy)	
Low Temp (C)	
Reading at Low Temp	
High Temp (C)	
Reading at High Temp	
Hydrometer Cal Slope	#DIV/0!
Hydrometer Cal Intercept	#DIV/0!
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500			0.00	g	100.0	Gravel	
#4	4750	487.90	489.11	1.21	g	99.1	Gravel	
#10	2000	462.54	473.22	10.68	g	91.4	Sand	Coarse
#20	850	373.80	430.35	56.55	g	50.7	Sand	Medium
#40	425	362.12	399.47	37.35	g	23.8	Sand	Medium
#60	250	352.17	360.37	8.20	g	17.9	Sand	Fine
#80	180	319.27	323.36	4.09	g	15.0	Sand	Fine
#100	150	328.47	330.86	2.39	g	13.3	Sand	Fine
#200	75	314.21	317.90	3.69	g	10.6	Sand	Fine
				0.00	g	10.6		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	139

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2						Silt	
5						Silt	
15						Silt	
30						Silt	
60						Silt	
250						Clay	
1440						Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	APT-01-79-80-0227202
Lab Sample ID	680-181268-A-3

Date Received	3/6/2020
Start Date	03/12/2020 10:42
End Date	03/16/2020 10:27

Dry Weight Determination

Tin Weight	1.01	g
Wet Sample + Tin	25.85	g
Dry Sample + Tin	23.12	g
% Moisture	10.99	%

Non-soil material:	na
Shape (> #10):	angular
Hardness (> #10):	hard

Date/Time in oven	03/12/2020 10:42
Date/Time out of oven	03/13/2020 6:45

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	44.62	177.39	132.77
Sample Weight (Oven Dried)			118

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			14.2
Sample <#10			104
% Passing #10			78.3

Hydrometer Data

Serial Number	
Calib. Date (mm/dd/yyyy)	
Low Temp (C)	
Reading at Low Temp	
High Temp (C)	
Reading at High Temp	
Hydrometer Cal Slope	#DIV/0!
Hydrometer Cal Intercept	#DIV/0!
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample	% Finer	Classification	Sub Class
3 inch	75000			0.00 g	100.0	Gravel	
2 inch	50000			0.00 g	100.0	Gravel	
1.5 inch	37500			0.00 g	100.0	Gravel	
1 inch	25000			0.00 g	100.0	Gravel	
3/4 inch	19000			0.00 g	100.0	Gravel	
3/8 inch	9500			0.00 g	100.0	Gravel	
#4	4750	487.90	489.36	1.46 g	98.8	Gravel	
#10	2000	462.54	475.29	12.75 g	88.0	Sand	Coarse
#20	850	378.32	417.74	39.42 g	54.6	Sand	Medium
#40	425	366.48	400.64	34.16 g	25.7	Sand	Medium
#60	250	348.07	355.29	7.22 g	19.6	Sand	Fine
#80	180	337.81	343.78	5.97 g	14.5	Sand	Fine
#100	150	328.12	331.47	3.35 g	11.7	Sand	Fine
#200	75	312.57	316.61	4.04 g	8.3	Sand	Fine
				0.00 g	8.3		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	118

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2						Silt	
5						Silt	
15						Silt	
30						Silt	
60						Silt	
250						Clay	
1440						Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	PWOW-02-86-03032020
Lab Sample ID	680-181268-A-4

Date Received	3/6/2020
Start Date	03/12/2020 10:44
End Date	03/16/2020 10:30

Dry Weight Determination

Tin Weight	1.00	g
Wet Sample + Tin	28.98	g
Dry Sample + Tin	26.58	g
% Moisture	8.58	%

Non-soil material:	na
Shape (> #10):	angular
Hardness (> #10):	hard

Date/Time in oven	03/12/2020 10:44
Date/Time out of oven	03/13/2020 6:44

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	47.86	184.72	136.86
Sample Weight (Oven Dried)			125

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			11.9
Sample <#10			113
% Passing #10			82.6

Hydrometer Data

Serial Number	
Calib. Date (mm/dd/yyyy)	
Low Temp (C)	
Reading at Low Temp	
High Temp (C)	
Reading at High Temp	
Hydrometer Cal Slope	#DIV/0!
Hydrometer Cal Intercept	#DIV/0!
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500			0.00	g	100.0	Gravel	
#4	4750	487.90	490.37	2.47	g	98.0	Gravel	
#10	2000	462.54	471.98	9.44	g	90.4	Sand	Coarse
#20	850	373.80	425.08	51.28	g	49.4	Sand	Medium
#40	425	362.12	393.39	31.27	g	24.4	Sand	Medium
#60	250	352.17	361.33	9.16	g	17.1	Sand	Fine
#80	180	319.27	323.19	3.92	g	14.0	Sand	Fine
#100	150	328.47	331.42	2.95	g	11.6	Sand	Fine
#200	75	314.21	317.90	3.69	g	8.7	Sand	Fine
				0.00	g	8.7		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	125

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2						Silt	
5						Silt	
15						Silt	
30						Silt	
60						Silt	
250						Clay	
1440						Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	PWOW-02-81-03032020
Lab Sample ID	680-181268-A-6

Date Received	3/6/2020
Start Date	03/12/2020 10:47
End Date	03/16/2020 10:38

Dry Weight Determination

Tin Weight	1.00	g
Wet Sample + Tin	25.19	g
Dry Sample + Tin	22.61	g
% Moisture	10.67	%

Non-soil material:	na
Shape (> #10):	angular
Hardness (> #10):	hard

Date/Time in oven	03/12/2020 10:47
Date/Time out of oven	03/13/2020 6:43

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)	47.83	191.07	143.24
Sample Weight (Oven Dried)			128

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			11.9
Sample <#10			116
% Passing #10			81

Hydrometer Data

Serial Number	
Calib. Date (mm/dd/yyyy)	
Low Temp (C)	
Reading at Low Temp	
High Temp (C)	
Reading at High Temp	
Hydrometer Cal Slope	#DIV/0!
Hydrometer Cal Intercept	#DIV/0!
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample	% Finer	Classification	Sub Class
3 inch	75000			0.00 g	100.0	Gravel	
2 inch	50000			0.00 g	100.0	Gravel	
1.5 inch	37500			0.00 g	100.0	Gravel	
1 inch	25000			0.00 g	100.0	Gravel	
3/4 inch	19000			0.00 g	100.0	Gravel	
3/8 inch	9500			0.00 g	100.0	Gravel	
#4	4750	487.90	489.25	1.35 g	98.9	Gravel	
#10	2000	462.54	473.06	10.52 g	90.7	Sand	Coarse
#20	850	378.32	441.26	62.94 g	41.5	Sand	Medium
#40	425	366.48	395.37	28.89 g	18.9	Sand	Medium
#60	250	348.07	353.22	5.15 g	14.9	Sand	Fine
#80	180	337.81	340.54	2.73 g	12.8	Sand	Fine
#100	150	328.12	329.68	1.56 g	11.6	Sand	Fine
#200	75	312.57	314.99	2.42 g	9.7	Sand	Fine
				0.00 g	9.7		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	128

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2						Silt	
5						Silt	
15						Silt	
30						Silt	
60						Silt	
250						Clay	
1440						Clay	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-122)	(73-131)	(80-120)
LCS 680-610865/1004	Lab Control Sample	94	102	91	99
LCSD 680-610865/5	Lab Control Sample Dup	95	102	90	96
MB 680-610865/9	Method Blank	85	102	94	100

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(80-120)	(80-122)	(73-131)	(80-120)
680-181268-5	IDW-1-03042020	87	105	102	98
680-181268-7	IDW-2-03042020	85	105	102	98
LB 680-610834/1-A	Method Blank	86	105	100	94

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(73-131)	(80-120)	(80-122)	(80-120)
680-181268-8	TB-0103052020	102	100	99	102
LCS 680-611064/4	Lab Control Sample	99	96	98	101
LCSD 680-611064/5	Lab Control Sample Dup	98	95	98	100
MB 680-611064/10	Method Blank	95	101	98	104

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCBP1	TCX1
Lab Sample ID	Client Sample ID	(14-130)	(40-130)
LCS 680-611512/23-A	Lab Control Sample	42	71
LCSD 680-611512/24-A	Lab Control Sample Dup	41	91

Surrogate Summary

Client: Geosyntec Consultants, Inc.
Job ID: 680-181268-1
Project/Site: Ashland - Brunswick Plant Soil

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)											
		DCBP2	TCX1										
Lab Sample ID	Client Sample ID	(14-130)	(40-130)										
MB 680-611512/22-A	Method Blank	31	81										

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)											
		DCBP1	TCX1										
Lab Sample ID	Client Sample ID	(14-130)	(40-130)										
680-181268-5	IDW-1-03042020	97	91										
680-181268-7	IDW-2-03042020	104	87										
LB 680-610654/1-D	Method Blank	77	101										

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 680-610865/9
Matrix: Solid
Analysis Batch: 610865

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
2-Butanone (MEK)	0.010	U	0.010		mg/L			03/13/20 13:42	1
Carbon tetrachloride	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
Chlorobenzene	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
Chloroform	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
1,4-Dichlorobenzene	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
1,2-Dichloroethane	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
1,1-Dichloroethene	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
Tetrachloroethene	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
Trichloroethene	0.0010	U	0.0010		mg/L			03/13/20 13:42	1
Vinyl chloride	0.0010	U	0.0010		mg/L			03/13/20 13:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*80 - 120*		*03/13/20 13:42*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 122*		*03/13/20 13:42*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*73 - 131*		*03/13/20 13:42*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*03/13/20 13:42*	*1*

Lab Sample ID: LCS 680-610865/1004
Matrix: Solid
Analysis Batch: 610865

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			0.0500	0.0520		mg/L		104	80 - 120		
2-Butanone (MEK)			0.250	0.223		mg/L		89	79 - 125		
Carbon tetrachloride			0.0500	0.0550		mg/L		110	67 - 125		
Chlorobenzene			0.0500	0.0571		mg/L		114	80 - 120		
Chloroform			0.0500	0.0482		mg/L		96	80 - 120		
1,4-Dichlorobenzene			0.0500	0.0533		mg/L		107	80 - 120		
1,2-Dichloroethane			0.0500	0.0478		mg/L		96	72 - 128		
1,1-Dichloroethene			0.0500	0.0416		mg/L		83	80 - 120		
Tetrachloroethene			0.0500	0.0623	*	mg/L		125	71 - 123		
Trichloroethene			0.0500	0.0577		mg/L		115	80 - 120		
Vinyl chloride			0.0501	0.0546		mg/L		109	80 - 129		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*91*		*73 - 131*
Toluene-d8 (Surr)	*99*		*80 - 120*

Lab Sample ID: LCSD 680-610865/5
Matrix: Solid
Analysis Batch: 610865

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			0.0500	0.0517		mg/L		103	80 - 120	1	20
2-Butanone (MEK)			0.250	0.235		mg/L		94	79 - 125	5	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-610865/5
Matrix: Solid
Analysis Batch: 610865

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon tetrachloride			0.0500	0.0545		mg/L		109	67 - 125	1	20
Chlorobenzene			0.0500	0.0596		mg/L		119	80 - 120	4	20
Chloroform			0.0500	0.0489		mg/L		98	80 - 120	2	20
1,4-Dichlorobenzene			0.0500	0.0539		mg/L		108	80 - 120	1	20
1,2-Dichloroethane			0.0500	0.0466		mg/L		93	72 - 128	3	50
1,1-Dichloroethene			0.0500	0.0492		mg/L		98	80 - 120	17	20
Tetrachloroethene			0.0500	0.0624	*	mg/L		125	71 - 123	0	20
Trichloroethene			0.0500	0.0581		mg/L		116	80 - 120	1	20
Vinyl chloride			0.0501	0.0551		mg/L		110	80 - 129	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*90*		*73 - 131*
Toluene-d8 (Surr)	*96*		*80 - 120*

Lab Sample ID: MB 680-611064/10
Matrix: Water
Analysis Batch: 611064

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	1.0	U	1.0		ug/L			03/16/20 15:00	1
p-Cymene	1.0	U	1.0		ug/L			03/16/20 15:00	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*03/16/20 15:00*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 122*		*03/16/20 15:00*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*73 - 131*		*03/16/20 15:00*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/16/20 15:00*	*1*

Lab Sample ID: LCS 680-611064/4
Matrix: Water
Analysis Batch: 611064

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Xylenes, Total			100	100		ug/L		100	80 - 120
p-Cymene			50.0	51.2		ug/L		102	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*99*		*73 - 131*
Toluene-d8 (Surr)	*101*		*80 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 680-611064/5
Matrix: Water
Analysis Batch: 611064

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Xylenes, Total			100	99.1		ug/L		99	80 - 120	1	20
p-Cymene			50.0	50.0		ug/L		100	80 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*80 - 122*
1,2-Dichloroethane-d4 (Surr)	*98*		*73 - 131*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: LB 680-610834/1-A
Matrix: Solid
Analysis Batch: 610865

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.020	U	0.020		mg/L			03/13/20 14:29	20
2-Butanone (MEK)	0.20	U	0.20		mg/L			03/13/20 14:29	20
Carbon tetrachloride	0.020	U	0.020		mg/L			03/13/20 14:29	20
Chlorobenzene	0.020	U	0.020		mg/L			03/13/20 14:29	20
Chloroform	0.020	U	0.020		mg/L			03/13/20 14:29	20
1,4-Dichlorobenzene	0.020	U	0.020		mg/L			03/13/20 14:29	20
1,2-Dichloroethane	0.020	U	0.020		mg/L			03/13/20 14:29	20
1,1-Dichloroethene	0.020	U	0.020		mg/L			03/13/20 14:29	20
Tetrachloroethene	0.020	U	0.020		mg/L			03/13/20 14:29	20
Trichloroethene	0.020	U	0.020		mg/L			03/13/20 14:29	20
Vinyl chloride	0.020	U	0.020		mg/L			03/13/20 14:29	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*80 - 120*		*03/13/20 14:29*	*20*
Dibromofluoromethane (Surr)	*105*		*80 - 122*		*03/13/20 14:29*	*20*
1,2-Dichloroethane-d4 (Surr)	*100*		*73 - 131*		*03/13/20 14:29*	*20*
Toluene-d8 (Surr)	*94*		*80 - 120*		*03/13/20 14:29*	*20*

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography

Lab Sample ID: MB 680-611512/22-A
Matrix: Solid
Analysis Batch: 611822

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 611512

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	0.00025	U	0.00025		mg/L		03/18/20 18:08	03/20/20 20:04	1
Endrin	0.000025	U	0.000025		mg/L		03/18/20 18:08	03/20/20 20:04	1
gamma-BHC (Lindane)	0.000025	U	0.000025		mg/L		03/18/20 18:08	03/20/20 20:04	1
Heptachlor	0.000025	U	0.000025		mg/L		03/18/20 18:08	03/20/20 20:04	1
Heptachlor epoxide	0.000025	U	0.000025		mg/L		03/18/20 18:08	03/20/20 20:04	1
Methoxychlor	0.000025	U	0.000025		mg/L		03/18/20 18:08	03/20/20 20:04	1
Toxaphene	0.0025	U	0.0025		mg/L		03/18/20 18:08	03/20/20 20:04	1

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography (Continued)

Lab Sample ID: MB 680-611512/22-A
Matrix: Solid
Analysis Batch: 611822

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 611512

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	31		14 - 130	03/18/20 18:08	03/20/20 20:04	1
Tetrachloro-m-xylene	81		40 - 130	03/18/20 18:08	03/20/20 20:04	1

Lab Sample ID: LCS 680-611512/23-A
Matrix: Solid
Analysis Batch: 611822

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 611512

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Endrin	0.0000500	0.0000475		mg/L		95	59 - 143
gamma-BHC (Lindane)	0.0000500	0.0000502		mg/L		100	52 - 130
Heptachlor	0.0000500	0.0000315		mg/L		63	35 - 130
Heptachlor epoxide	0.0000500	0.0000492		mg/L		98	52 - 130
Methoxychlor	0.0000500	0.0000528		mg/L		106	52 - 136

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl	42		14 - 130
Tetrachloro-m-xylene	71		40 - 130

Lab Sample ID: LCSD 680-611512/24-A
Matrix: Solid
Analysis Batch: 611822

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 611512

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Endrin	0.0000500	0.0000536		mg/L		107	59 - 143	12	50
gamma-BHC (Lindane)	0.0000500	0.0000507		mg/L		101	52 - 130	1	50
Heptachlor	0.0000500	0.0000351		mg/L		70	35 - 130	11	50
Heptachlor epoxide	0.0000500	0.0000508		mg/L		102	52 - 130	3	50
Methoxychlor	0.0000500	0.0000549		mg/L		110	52 - 136	4	50

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCB Decachlorobiphenyl	41		14 - 130
Tetrachloro-m-xylene	91		40 - 130

Lab Sample ID: LB 680-610654/1-D
Matrix: Solid
Analysis Batch: 611822

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 611512

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	0.012	U	0.012		mg/L		03/18/20 18:08	03/20/20 19:50	1
Endrin	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/20/20 19:50	1
gamma-BHC (Lindane)	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/20/20 19:50	1
Heptachlor	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/20/20 19:50	1
Heptachlor epoxide	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/20/20 19:50	1
Methoxychlor	0.0012	U	0.0012		mg/L		03/18/20 18:08	03/20/20 19:50	1
Toxaphene	0.12	U	0.12		mg/L		03/18/20 18:08	03/20/20 19:50	1

Method: 8081B/8082A - Organochlorine Pesticides and Polychlorinated Biphenyls by Gas Chromatography (Continued)

Lab Sample ID: LB 680-610654/1-D
Matrix: Solid
Analysis Batch: 611822

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 611512

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	77		14 - 130	03/18/20 18:08	03/20/20 19:50	1
Tetrachloro-m-xylene	101		40 - 130	03/18/20 18:08	03/20/20 19:50	1

Method: SM 2540G - Total, Fixed, and Volatile Solids

Lab Sample ID: MB 680-611175/1
Matrix: Solid
Analysis Batch: 611175

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fixed Solids	100		0.10		%			03/13/20 15:55	1
Total Solids	100		0.10		%			03/13/20 15:55	1
Total Volatile Solids	0.10	U	0.10		%			03/13/20 15:55	1
Ash Content	100		0.10		%			03/13/20 15:55	1

Lab Sample ID: 680-181268-1 DU
Matrix: Solid
Analysis Batch: 611175

Client Sample ID: APT-01-84-85-02272020
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Fixed Solids	100	H H3		99.6		%				0	
Total Solids	92	H H3		91.8		%				0.05	5
Total Volatile Solids	0.42	H H3		0.412		%				2	
Ash Content	100	H H3		99.6		%				0	

Method: WALKLEY BLACK - Organic Carbon, Total (TOC)

Lab Sample ID: MB 400-483369/1
Matrix: Solid
Analysis Batch: 483369

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.10	U	0.10		Percent			03/24/20 08:15	1

Lab Sample ID: LCS 400-483369/2
Matrix: Solid
Analysis Batch: 483369

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon			0.200	0.232		Percent		116	65 - 126		

GC/MS VOA

Leach Batch: 610505

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-5	IDW-1-03042020	TCLP	Solid	1311	
680-181268-7	IDW-2-03042020	TCLP	Solid	1311	

Leach Batch: 610834

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 680-610834/1-A	Method Blank	TCLP	Solid	1311	

Analysis Batch: 610865

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-5	IDW-1-03042020	TCLP	Solid	8260B	610505
680-181268-7	IDW-2-03042020	TCLP	Solid	8260B	610505
LB 680-610834/1-A	Method Blank	TCLP	Solid	8260B	610834
MB 680-610865/9	Method Blank	Total/NA	Solid	8260B	
LCS 680-610865/1004	Lab Control Sample	Total/NA	Solid	8260B	
LCSD 680-610865/5	Lab Control Sample Dup	Total/NA	Solid	8260B	

Analysis Batch: 611064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-8	TB-0103052020	Total/NA	Water	8260B	
MB 680-611064/10	Method Blank	Total/NA	Water	8260B	
LCS 680-611064/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 680-611064/5	Lab Control Sample Dup	Total/NA	Water	8260B	

GC Semi VOA

Leach Batch: 610654

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-5	IDW-1-03042020	TCLP	Solid	1311	
680-181268-7	IDW-2-03042020	TCLP	Solid	1311	
LB 680-610654/1-D	Method Blank	TCLP	Solid	1311	

Prep Batch: 611512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-5	IDW-1-03042020	TCLP	Solid	3520C	610654
680-181268-7	IDW-2-03042020	TCLP	Solid	3520C	610654
LB 680-610654/1-D	Method Blank	TCLP	Solid	3520C	610654
MB 680-611512/22-A	Method Blank	Total/NA	Solid	3520C	
LCS 680-611512/23-A	Lab Control Sample	Total/NA	Solid	3520C	
LCSD 680-611512/24-A	Lab Control Sample Dup	Total/NA	Solid	3520C	

Analysis Batch: 611822

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 680-610654/1-D	Method Blank	TCLP	Solid	8081B/8082A	611512
MB 680-611512/22-A	Method Blank	Total/NA	Solid	8081B/8082A	611512
LCS 680-611512/23-A	Lab Control Sample	Total/NA	Solid	8081B/8082A	611512
LCSD 680-611512/24-A	Lab Control Sample Dup	Total/NA	Solid	8081B/8082A	611512

Analysis Batch: 611964

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-5	IDW-1-03042020	TCLP	Solid	8081B/8082A	611512
680-181268-7	IDW-2-03042020	TCLP	Solid	8081B/8082A	611512

QC Association Summary

Client: Geosyntec Consultants, Inc.
Job ID: 680-181268-1
Project/Site: Ashland - Brunswick Plant Soil

General Chemistry

Analysis Batch: 483369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-1	APT-01-84-85-02272020	Total/NA	Solid	WALKLEY BLACK	
680-181268-2	APT-01-94-95-02272020	Total/NA	Solid	WALKLEY BLACK	
680-181268-3	APT-01-79-80-02272020	Total/NA	Solid	WALKLEY BLACK	
680-181268-4	PWOW-02-86-03032020	Total/NA	Solid	WALKLEY BLACK	
680-181268-6	PWOW-02-81-03032020	Total/NA	Solid	WALKLEY BLACK	
MB 400-483369/1	Method Blank	Total/NA	Solid	WALKLEY BLACK	
LCS 400-483369/2	Lab Control Sample	Total/NA	Solid	WALKLEY BLACK	

Analysis Batch: 611175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-1	APT-01-84-85-02272020	Total/NA	Solid	SM 2540G	
680-181268-2	APT-01-94-95-02272020	Total/NA	Solid	SM 2540G	
680-181268-3	APT-01-79-80-02272020	Total/NA	Solid	SM 2540G	
680-181268-4	PWOW-02-86-03032020	Total/NA	Solid	SM 2540G	
680-181268-6	PWOW-02-81-03032020	Total/NA	Solid	SM 2540G	
MB 680-611175/1	Method Blank	Total/NA	Solid	SM 2540G	
680-181268-1 DU	APT-01-84-85-02272020	Total/NA	Solid	SM 2540G	

Geotechnical

Analysis Batch: 153248

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
680-181268-1	APT-01-84-85-02272020	Total/NA	Solid	D422	
680-181268-2	APT-01-94-95-02272020	Total/NA	Solid	D422	
680-181268-3	APT-01-79-80-02272020	Total/NA	Solid	D422	
680-181268-4	PWOW-02-86-03032020	Total/NA	Solid	D422	
680-181268-6	PWOW-02-81-03032020	Total/NA	Solid	D422	

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Client Sample ID: APT-01-84-85-02272020

Lab Sample ID: 680-181268-1

Date Collected: 02/27/20 11:30
Matrix: Solid
Date Received: 03/06/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540G		1			611175	03/13/20 15:55	PG	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	WALKLEY BLACK		1			483369	03/24/20 08:15	RRC	TAL PEN
	Instrument ID: NOEQUIP									
Total/NA	Analysis	D422		1			153248	03/12/20 10:37	CPF	TAL BUR
	Instrument ID: D422_import									

Client Sample ID: APT-01-94-95-02272020

Lab Sample ID: 680-181268-2

Date Collected: 02/27/20 11:30
Matrix: Solid
Date Received: 03/06/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540G		1			611175	03/13/20 15:55	PG	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	WALKLEY BLACK		1			483369	03/24/20 08:15	RRC	TAL PEN
	Instrument ID: NOEQUIP									
Total/NA	Analysis	D422		1			153248	03/12/20 10:40	CPF	TAL BUR
	Instrument ID: D422_import									

Client Sample ID: APT-01-79-80-02272020

Lab Sample ID: 680-181268-3

Date Collected: 02/27/20 11:30
Matrix: Solid
Date Received: 03/06/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540G		1			611175	03/13/20 15:55	PG	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	WALKLEY BLACK		1			483369	03/24/20 08:15	RRC	TAL PEN
	Instrument ID: NOEQUIP									
Total/NA	Analysis	D422		1			153248	03/12/20 10:42	CPF	TAL BUR
	Instrument ID: D422_import									

Client Sample ID: PWOW-02-86-03032020

Lab Sample ID: 680-181268-4

Date Collected: 03/03/20 13:00
Matrix: Solid
Date Received: 03/06/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540G		1			611175	03/13/20 15:55	PG	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	WALKLEY BLACK		1			483369	03/24/20 08:15	RRC	TAL PEN
	Instrument ID: NOEQUIP									
Total/NA	Analysis	D422		1			153248	03/12/20 10:44	CPF	TAL BUR
	Instrument ID: D422_import									

Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Client Sample ID: IDW-1-03042020

Lab Sample ID: 680-181268-5

Date Collected: 03/04/20 16:00
Matrix: Solid
Date Received: 03/06/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			25.01 g	500 mL	610505	03/11/20 12:46	JEB	TAL SAV
TCLP	Analysis	8260B		20	5 mL	5 mL	610865	03/13/20 17:12	SMP	TAL SAV
	Instrument ID: CMSC									
TCLP	Leach	1311			100.03 g	2000 mL	610654	03/12/20 13:55	JEB	TAL SAV
TCLP	Prep	3520C			20.4 mL	5 mL	611512	03/18/20 18:08	CMJ	TAL SAV
TCLP	Analysis	8081B/8082A		1			611964	03/21/20 23:36	JCK	TAL SAV
	Instrument ID: CSGJ									

Client Sample ID: PWOW-02-81-03032020

Lab Sample ID: 680-181268-6

Date Collected: 03/03/20 13:00
Matrix: Solid
Date Received: 03/06/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540G		1			611175	03/13/20 15:55	PG	TAL SAV
	Instrument ID: NOEQUIP									
Total/NA	Analysis	WALKLEY BLACK		1			483369	03/24/20 12:21	RRC	TAL PEN
	Instrument ID: NOEQUIP									
Total/NA	Analysis	D422		1			153248	03/12/20 10:47	CPF	TAL BUR
	Instrument ID: D422_import									

Client Sample ID: IDW-2-03042020

Lab Sample ID: 680-181268-7

Date Collected: 03/04/20 16:00
Matrix: Solid
Date Received: 03/06/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			25.00 g	500 mL	610505	03/11/20 12:46	JEB	TAL SAV
TCLP	Analysis	8260B		20	5 mL	5 mL	610865	03/13/20 17:36	SMP	TAL SAV
	Instrument ID: CMSC									
TCLP	Leach	1311			100.01 g	2000 mL	610654	03/12/20 13:55	JEB	TAL SAV
TCLP	Prep	3520C			20.1 mL	5 mL	611512	03/18/20 18:08	CMJ	TAL SAV
TCLP	Analysis	8081B/8082A		1			611964	03/21/20 23:50	JCK	TAL SAV
	Instrument ID: CSGJ									

Client Sample ID: TB-0103052020

Lab Sample ID: 680-181268-8

Date Collected: 03/05/20 11:00
Matrix: Water
Date Received: 03/06/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	611064	03/16/20 18:53	Y1S	TAL SAV
	Instrument ID: CMSB									

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

TAL PEN = Eurofins TestAmerica, Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TAL SAV = Eurofins TestAmerica, Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins

Client Information	Sampler: Ben Weinmann	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-113093-43505.1
Client Contact: Adria Reimer	Phone: 404-804-3513	E-Mail: jerry.lanier@testamericainc.com		Page: Page 1 of 2
Company: Geosyntec Consultants, Inc				Job #:
Address: 1255 Roberts Blvd, NW Suite 200	Due Date Requested:			
City: Kennesaw	TAT Requested (days):			
State, Zip: GA, 30144				
Phone: 678-202-9564(Tel)	PO #: PO814385			
Email: AReimer@Geosyntec.com	WO #: Task 100			
Project Name: Ashland - Brunswick Plant Soil	Project #: 68022348			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	WALKLEY_BLACK - Walkley_Black	D422 - Sieve Only	8260B - TCLP VOC	8081B_8082A - TCLP Pest	25°C/9-point titration	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N	N		
~~PWOW-02_81_03032020~~	~~3/3/20~~	1300	G	Solid					X	X		BW	
APT-01_84-85_02272020	2/27/20	1130	G	Solid			X	X			X		
APT-01_94-95_02272020	2/27/20	1130	G	Solid			X	X			X		
APT-01_89-90_02272020	2/27/20	1130	G	Solid			X	X			X		
PWOW-02_80_03032020	3/3/20	1300	G	Solid			X	X			X		
EDW-1_03042020	3/4/20	1600	C	Solid					X	X			
PWOW-02_81_03032020	3/3/20	1300	G	Solid			X	X			X		
EDW-2_03042020	3/4/20	1600	C	Solid					X	X			
TB-01_03052020	3/5/20	1100		~~Water~~ Solid									
				Solid									
				Water									

680-181268 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer tha...
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Ben Weinmann	1210 / 3/4/20	Geosyntec	DW	3-6-2020/0915	SW

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 5.2/5.6

Ver: 01/16/2019

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

680-181268 Chain of Custody

Eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A		o: 603358.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Georgia	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Florida; State Program - Georgia		Job #: 680-181268-1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 3/18/2020			
City: South Burlington	TAT Requested (days):			
State, Zip: VT, 05403				
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:			
Email:	WO #:			
Project Name: Ashland - Brunswick Plant Soil	Project #: 68022348			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	D422/ Sieve Only	Special Instructions/Note:
APT-01-84-85-02272020 (680-181268-1)	2/27/20	11:30 Eastern		Solid	X	
APT-01-94-95-02272020 (680-181268-2)	2/27/20	11:30 Eastern		Solid	X	
APT-01-79-80-02272020 (680-181268-3)	2/27/20	11:30 Eastern		Solid	X	
PWOW-02-86-03032020 (680-181268-4)	3/3/20	13:00 Eastern		Solid	X	
PWOW-02-81-03032020 (680-181268-6)	3/3/20	13:00 Eastern		Solid	X	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 3/9/2020 1350	Company	Received by:	Date/Time: 3/10/2020	Company TAB RL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Yes ☐ No	Custody Seal No.: 1164 3303	Cooler Temperature(s) °C and Other Remarks: 2.7

Ver: 01/16/2019

eurofins | Environment Testing TestAmerica

Part # 159469-434 RIT2 EXP 08/20

ORIGIN ID:SAVA (912) 354-7858
SHIPPING
EUROFINS/TESTAMERICA
5102 LA ROUCHE AVE

SAVANNAH, GA 31404
UNITED STATES US

SHIP DATE: 09MAR20
ACTWGT: 40.00 LB MAN
CAD: 0801261/CAFE3311

BILL RECIPIENT

TO

TEST AMERICA BURLINGTON
30 COMMUNITY DRIVE
STE 11
SOUTH BURLINGTON VT 05403

(802) 660-1990 REF:
INV:
PO: DEPT:

FedEx Express

TUE - 10 MAR 10:30A
PRIORITY OVERNIGHT

TRK# 0201 1328 9409 2509

XH BTVA

05403
VT-US BTV

Eurofins TestAmerica, Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858 Fax: 912-352-0165

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Lanier, Jerry A	Carrier Tracking No(s):	COC No: 680-603346.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: jerry.lanier@testamericainc.com	State of Origin: Georgia	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Florida; State Program - Georgia		Job #: 680-181268-1
Address: 3355 McLemore Drive,	Due Date Requested: 3/18/2020			
City: Pensacola	TAT Requested (days):			
State, Zip: FL, 32514				
Phone: 850-474-1001(Tel) 850-478-2671(Fax)	PO #:			
Email:	WO #:			
Project Name: Ashland - Brunswick Plant Soil	Project #: 68022348			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	WALKLEY_BLACK	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
APT-01-84-85-02272020 (680-181268-1)	2/27/20	11:30 Eastern		Solid			X	1	
APT-01-94-95-02272020 (680-181268-2)	2/27/20	11:30 Eastern		Solid			X	1	
APT-01-79-80-02272020 (680-181268-3)	2/27/20	11:30 Eastern		Solid			X	1	
PWOW-02-86-03032020 (680-181268-4)	3/3/20	13:00 Eastern		Solid			X	1	
PWOW-02-81-03032020 (680-181268-6)	3/3/20	13:00 Eastern		Solid			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	3/9/2020 1325				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 3-10-20 9:17	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 5.5 IR8

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 680-181268-1

Login Number: 181268

List Number: 1

Creator: Mooken, Darmal

List Source: Eurofins TestAmerica, Savannah

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 680-181268-1

Login Number: 181268
List Number: 2
Creator: Khudaier, Zahraa

List Source: Eurofins TestAmerica, Burlington
List Creation: 03/10/20 12:25 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	1164383
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.7ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 680-181268-1

Login Number: 181268
List Number: 3
Creator: Gore, Beija K

List Source: Eurofins TestAmerica, Pensacola
List Creation: 03/10/20 05:12 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.5 °C IR 8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Accreditation/Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Ashland - Brunswick Plant Soil

Job ID: 680-181268-1

Laboratory: Eurofins TestAmerica, Savannah

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E87052	06-30-20
Georgia	State	E87052	06-30-20

Laboratory: Eurofins TestAmerica, Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-23
Connecticut	State	PH-0751	09-30-21
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-15-20
Florida	NELAP	E87467	06-30-20
Minnesota	NELAP	050-999-436	12-31-20
New Hampshire	NELAP	2006	12-18-20
New Jersey	NELAP	VT972	06-30-20
New York	NELAP	10391	03-31-20
Pennsylvania	NELAP	68-00489	04-30-20
Rhode Island	State	LAO00298	12-30-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00272	08-09-20
Vermont	State	VT4000	12-31-20
Virginia	NELAP	460209	12-14-20

Laboratory: Eurofins TestAmerica, Pensacola

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alabama	State	40150	07-01-20
ANAB	ISO/IEC 17025	L2471	02-23-23
Arizona	State	AZ0710	01-13-21
Arkansas DEQ	State	88-0689	09-01-20
California	State	2510	07-01-20
Florida	NELAP	E81010	06-30-20
Georgia	State	E81010(FL)	06-30-20
Illinois	NELAP	004586	10-09-20
Iowa	State	367	08-01-20
Kansas	NELAP	E-10253	08-16-20
Kentucky (UST)	State	53	06-30-20
Kentucky (WW)	State	KY98030	12-31-20
Louisiana	NELAP	30976	06-30-20
Louisiana (DW)	State	LA017	12-31-20
Maryland	State	233	09-30-20
Massachusetts	State	M-FL094	06-30-20
Michigan	State	9912	05-06-20
Minnesota	NELAP	012-999-481	12-31-20
New Jersey	NELAP	FL006	06-30-20
New York	NELAP	12115	04-01-20
New York	NELAP Secondary AB	12115	04-01-20
North Carolina (WW/SW)	State	314	12-31-20
Oklahoma	State	9810-186	08-31-20
Pennsylvania	NELAP	68-00467	01-31-21
Rhode Island	State	LAO00307	12-30-20