



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE

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July 18, 2017

Jason E. Williams
Manager, Generation Environmental Services
Chesterfield Power Station
Transmitted via email: Jason.E.Williams@dominionenergy.com

Re: Concept Engineering Report Revision - Centralized Source Water Treatment System
VPDES Permit No. VA0004146
Dominion – Chesterfield Power Station

Dear Mr. Williams:

The revised Concept Engineering Report (CER) received July 17, 2017 under cover letter dated July 14, 2017, for the above referenced project is approved. This action is in accordance with a memorandum dated July 18, 2017, a copy of which is enclosed for your information. As stipulated in Part I.C.20 of the facility's VPDES permit, noncompliance with the CER shall be deemed a violation of the permit.

The Department of Environmental Quality (DEQ) approval does not relieve you of your responsibility to:

1. Construct the treatment system in accordance with the CER;
2. Operate the treatment system in a manner to consistently meet the facility's performance requirements;
3. Correct design and/or operation deficiencies; or
4. Comply with all other applicable laws and regulations.

Part I.C.20 of the facility's VPDES permit requires that no later than 14 days following completion of construction of any project for which a CER has been approved, written notification shall be submitted to the DEQ – Piedmont Regional Office certifying, that based on an inspection of the project, construction was completed in accordance with the approved CER.

Nothing in this CER approval preempts, modifies, or otherwise alters any effluent limitations or monitoring requirements in the VPDES Permit No. VA0004146.

Please contact Joseph Bryan at (804) 527-5014 or via email at Joseph.Bryan@deq.virginia.gov if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads 'Emilee C. Adamson'.

Emilee C. Adamson
Planning and Water Permit Manager

Enclosure: Approval Memorandum

cc: Kenneth Roller, Dominion Kimberly Lanterman, Dominion; Heather Deihls, DEQ

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY *Piedmont Regional Office*

4949-A Cox Road

Glen Allen, VA 23060

804/527-5020

SUBJECT: Revised Concept Engineering Report
Centralized Source Water Treatment System (CSWTS)
Dominion – Chesterfield Power Station, VPDES Permit No. VA0004146

TO: Emilee Adamson, Planning and Water Permit Manager

FROM: Joseph Bryan, VPDES Permit Writer

DATE: July 18, 2017

COPIES: File
Kenneth Roller – Dominion

Project Name: Concept Engineering Report
Centralized Source Water Treatment System

Project Owner: Virginia Electric and Power Company d/b/a Dominion Virginia Power

Background: Dominion Virginia Power submitted a Concept Engineering Report (CER) prepared by Golder Associates under a cover letter dated May 25, 2017, for the Centralized Source Water Treatment System (CSWTS). The CER was submitted in accordance with Special Condition I.C.20 of VPDES Permit No. VA0004146 and was received by DEQ on May 25, 2017. Additional information was provided by Dominion on July 17, 2017, along with a revised CER.

Project Scope: Wastewater and contact stormwater generated during the decanting and dewatering of the Lower Ash Pond and Upper Ash Pond will be directed to the Centralized Source Water Treatment System (CSWTS) which will discharge through internal Outfall 101. The CSWTS has been designed to treat a maximum design flow of 1,500 gallons per minute and to ensure compliance with the applicable effluent limits in VPDES Permit VA0004146. The proposed treatment process will utilize chemical oxidation/reduction, chemical coagulation, chemical flocculation, gravity settling, mechanical filtration, and enhanced treatment using media (as needed) to treat the wastewater and contact stormwater. The treatment system components and additional details are included in the Concept Engineering Report.

Staff Comments: The staff has no objections to the facilities as proposed in the submittal dated July 14, 2017.

Recommendation: The staff recommends that the revised Concept Engineering Report be approved.

Approved:



Emilee C. Adamson
Planning and Water Permit Manager

Date:

July 18, 2017



July 14, 2017

Ms. Emilee Adamson
VPDES Permit Manager
Virginia Department of Environmental Quality
Piedmont Regional Office
4949A Cox Road
Glen Allen, Virginia 23060

Subj: Revised Centralized Source Water Treatment System (CSWTS) Concept Engineering Report - VPDES Permit VA0004146 – Chesterfield Power Station

Dear Ms. Adamson:

Please find enclosed a revised Conceptual Engineering Report (CER) for the Centralized Source Water Treatment System (CSWTS) at the Chesterfield Power Station. The CER has been revised to incorporate additional information requested in the additional information request letter received from DEQ on July 7, 2017, as well as additional comments received during a July 13, 2017 meeting with DEQ. The following lists the specific information requests from the July 7, 2017 letter and the location of the response in the revised CER.

With regard to design:

- a. Provide a separate section describing the Collection System(s) to be utilized in conveying the source waters to the treatment system. This section should include a general list of the equipment components of the collection system(s) and their size, volume, and/or flow rates.

A new Section 4.1 has been added titled "Collection System." This section describes and lists the general equipment components of the collection system(s) that will be utilized to convey the source waters to the treatment system.

- b. Provide a separate section with a general list of the equipment components of the Treatment System, including their size, volume, and/or flow rates. This section should include information regarding the equipment components of the Enhanced Treatment System and Storage Tanks.

A new Section 4.2 has been added titled "Treatment System and Storage Tank Components." This section provides a general list of the equipment components of the treatment system, enhanced treatment system, and storage tanks. This list also includes the size and/or volume of the equipment components.

With regard to operation:

- a. Incorporate the size, volume, and/or flow rates noted above into the existing descriptions of the Treatment Process (4. 1), Enhanced Treatment (4. 2), and Storage Tanks (5. 0).

Section 4.1 (now 4.3) now includes the max flow rate of the CSWTS and the sizes of tanks and filtration systems. Section 4.2 (now 4.4) is now referenced in 4.1 (now 4.3) in regards to the flow rate going through enhanced treatment. Section 5.0 now includes the size of the storage tanks. In addition, Drawing 4, referenced in Section 4.0, now includes a more detailed process flow diagram that shows the sizes and/or flowrates of each of the treatment system components.

During the July 13, 2017 meeting, DEQ also requested that language be included in the revised CER that states DEQ will be provided with more information regarding the conveyance of the water from the UAP sedimentation basin to the CSWTS prior to initiating drawdown of the basin. DEQ also requested information be added to the narrative in response to our request to add optional media vessels throughout the treatment system.

In response to these comments, Section 2.0 has been updated to include a sentence stating the DEQ will be informed of the process regarding the conveyance of the water from the UAP sedimentation basin to the CSWTS prior to initiating drawdown of the basin. Sentences have also been added in the last paragraph of Section 4.3 and the second to last paragraph of Section 4.4 explaining the additional optional media vessels. In addition, a note has been added to Drawing 4.

In addition to the above changes, as we discussed in the July 13, 2017 meeting, the treatment vendor for the CSWTS has changed, and this change has been reflected in the revised CER.

We would greatly appreciate DEQ's prompt review and approval of the revised CER. Please contact Ken Roller at Kenneth.Roller@dom.com if you have any questions related to this submittal.

Sincerely,



Jason E. Williams
Manager
Generation Environmental Services

Attachment

cc: Mr. Joseph Bryan, DEQ



Concept Engineering Report
Centralized Source Water Treatment System

A world of
capabilities
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CONCEPT ENGINEERING REPORT

CENTRALIZED SOURCE WATER TREATMENT SYSTEM

CHESTERFIELD POWER STATION
VPDES Permit No. VA0004146



**Dominion
Energy**SM

Submitted To: Dominion – Chesterfield Power Station
500 Coxendale Road
Chester, VA 23836

Submitted By: Golder Associates, Inc.
2108 W. Laburnum Avenue
Suite 200
Richmond, VA 23227



May 2017
Revised July 2017 (Rev. 1)

1520610



Table of Contents

1.0	INTRODUCTION.....	1
1.1	Site Description	2
2.0	SOURCE WATERS	2
2.1	Lower Ash Pond Decant Water.....	2
2.2	Ash Pond Contact Stormwater.....	3
2.3	Ash Pond Ash Dewatering Water.....	3
3.0	SOURCE WATER CHARACTERISTICS.....	3
4.0	TREATABILITY	4
4.1	Collection System	4
4.2	Treatment System and Storage Tank Components.....	5
4.3	Treatment Process.....	6
4.4	Enhanced Treatment (if necessary).....	7
5.0	STORAGE TANKS.....	8

Tables

Table 1 – Summary of Constituents in Lower Ash Pond and Upper Ash Pond

Table 2 – CSWTS Process Chemicals and Polymers

Table 3 – CSWTS Process Medias

Drawings

Drawing 1 – Station Outfalls and Facilities

Drawing 2 – Centralized Source Water Treatment System (CSWTS) Site Plan

Drawing 3 – Source Water Piezometer and Decant Water Sample Locations

Drawing 4 – Process Flow Diagram

Drawing 5 – Conceptual Optional Influent/Effluent Storage Tank Schematic

Appendices

Appendix A – ProAct’s Treatability Study

1.0 INTRODUCTION

This Concept Engineering Report (CER) has been prepared for the proposed Centralized Source Water Treatment System (CSWTS) at Dominion's Chesterfield Power Station (Station), in accordance with the Station's Virginia Pollutant Discharge Elimination System (VPDES) Permit No. VA0004146 (VPDES Permit). The Station is the largest fossil-fueled power station in Virginia, capable of generating more than 1,600 megawatts, and is fueled mainly by coal. Coal Combustion Residuals (CCR) from coal-fired operations are currently stored in two surface impoundments on-site, the Upper Ash Pond (UAP) and the Lower Ash Pond (LAP).

Dominion is closing the Upper and Lower Ash Ponds in accordance with the U.S. Environmental Protection Agency's final CCR rule, which is codified in 40 CFR 257 and has been adopted by reference into the Virginia Solid Waste Management Regulations (VSWMR) at 9VAC20-81-10 *et seq.* In response to the final rule, the Station is converting from a wet CCR management system to a dry CCR management system. Station wastewater and contact stormwater are currently sent to the LAP for treatment and discharge through Outfall 004. As part of the conversion, a new Low Volume Wastewater Treatment System (LVWWTS) will be constructed to replace the LAP for treatment of the Station's wastewater streams. Following construction and commissioning of the LVWWTS, treated wastewaters will be discharged through internal Outfall 301.

Once the Station's wastewater streams have been permanently rerouted from the LAP to the LVWWTS and discharge through internal Outfall 301 commences, the surface water in the LAP will be allowed to drain over the existing unmodified weir utilizing the existing standard LAP operating procedures. After the gravity discharge ends, the weir will be raised and Outfall 004 will be plugged to prevent further discharges.

In accordance with Special Condition I.C.24 of the Station's VPDES permit, drawdown will commence with the intentional lowering of the pond elevation below 2 feet 2 inches from the top of the concrete outfall structure of Outfall 004 (for the LAP) and 15 feet 6 inches from the top of the concrete outfall structure of Outfall 005 (for the UAP sedimentation basin). Following the commencement of drawdown, wastewaters from the decanting and dewatering of the pond in which the drawdown was initiated will be directed to the CSWTS that is the subject of this CER. Wastewaters treated in the CSWTS will be discharged through internal Outfall 101. The discharge through internal Outfall 101 will be metered and sampled for compliance with the required effluent limitations in the Station's VPDES Permit. Prior to the commencement of the discharge of drawdown water from the Upper or Lower Ash Ponds, a notification will be submitted to the DEQ in accordance with Special Condition I.C.24 of the permit. A second notification will be provided within 24 hours after initiating the discharge of drawdown water from the Upper or Lower Ash Ponds.

Dominion has prepared this CER to provide a description of the proposed CSWTS that has been specifically designed to comply with the numeric effluent limitations in Part I.A.2 of the permit. The conceptual

engineering systems and processes presented herein reflect the planned conceptual approach for the CSWTS and may not reflect the specific details of the final design system configuration. Written notification will be submitted to the DEQ in accordance with Special Condition I.C.20 of the permit certifying that, based on an inspection of the project, construction of the CSWTS was completed in accordance with the CER.

1.1 Site Description

The Chesterfield Power Station is located in Chesterfield County, Virginia, at 500 Coxendale Road just east of I-95 and south of the James River. A map of the Station and the Station's outfalls is shown on an aerial photograph as Drawing 1. The Station's property consists mainly of wooded, open, and developed land. The eastern, southern, and western boundaries of the property are bordered by undeveloped land, tidal flats, and river bottom associated with the Old Channel of the James River. The northern and northeastern boundaries border Henricus Historical Park, undeveloped land, and the James River.

The proposed CSWTS is located southeast of the Station's generating facilities and north of Coxendale Road on Dominion property. A site plan with the proposed CSTWS location is presented on an aerial photograph as Drawing 2.

2.0 SOURCE WATERS

Source waters from the LAP and the UAP sedimentation basin include Lower Ash Pond Decant Water, Ash Pond Contact Stormwater, and Ash Pond Dewatering Water as described below. All source waters will be treated as described in Section 4.0 and subject to the triggers for enhanced treatment as identified in Section 4.4. Treatment system effluent will ultimately be discharged to Outfall 001 or Outfall 002 via internal Outfall 101. Source waters may be conveyed to the LAP, the temporary influent storage tanks, and/or to the start of the treatment system. Source waters may also be temporarily stored in the UAP sedimentation basin, as necessary, during the LAP decanting and dewatering process and prior to starting the decanting and dewatering process in the UAP sedimentation basin (in this situation there would be no discharge from Outfall 005). Prior to initiating the drawdown of the UAP sedimentation basin, as defined in Special Condition I.C.24 of the VPDES Permit, the DEQ will be informed of the process in which water will be conveyed from the UAP to the CSWTS.

2.1 Lower Ash Pond Decant Water

The LAP Decant Water includes surface waters that result from the mixing of a number of wastewater types in the LAP, including, but not limited to: stormwater, low volume wastewater, ash dewatering water, ash sluice water, non-chemical cleaning wastes, chemical cleaning wastes via the metals pond, coal pile runoff, flue gas desulfurization (FGD) wastewater treatment plant effluent, screen backwash associated with the reuse of Proctors Creek wastewater treatment plant effluent, and wastewater from the Station's car wash (non-chemical). It will be necessary to decant the LAP in order to dewater the CCR in the LAP.

2.2 Ash Pond Contact Stormwater

Ash Pond Contact Stormwater is stormwater that has come into contact with the CCR in the Upper and Lower Ash Ponds. Contact stormwater in the UAP is currently routed to the UAP sedimentation basin in the eastern end of the pond and is considered process wastewater. Under the existing VPDES permit, contact stormwater in the UAP sedimentation basin may be directed to Outfall 005 or to the LAP to discharge through Outfall 004. Once drawdown of the UAP sedimentation basin is initiated, as defined in Special Condition I.C.24 of the VPDES Permit, the UAP contact stormwater will be sent to the CSWTS either by way of the LAP (if still available) or through a direct pipe connection.

2.3 Ash Pond Ash Dewatering Water

Ash Pond Ash Dewatering Water is considered to be the pore water within the CCR mass in the LAP and in the UAP sedimentation basin. This source water refers to the water that is produced from dewatering the CCR in order to stabilize the CCR. The Ash Pond Ash Dewatering Water is generated from the CCR dewatering process through mechanical means (e.g., vacuum wells, sump pumps, or other *in situ* withdrawal methods) and/or from passive methods (e.g., cutting drainage ditches or rim ditches into the CCR mass).

3.0 SOURCE WATER CHARACTERISTICS

To characterize the expected quality of source waters that will be treated in the CSWTS, a series of four sampling events was conducted between May and July 2016 by Golder Associates Inc., an independent consultant to Dominion. During each event, six samples were obtained from piezometers installed in the CCR mass, and four samples were obtained from surface water in the LAP and the UAP sedimentation basin. Additionally, a fifth surface water sample (S-5) was obtained from the LAP during the July sampling event. The samples were collected from representative locations within the source streams (Drawing 3).

During each sampling event for each source water, representative samples were collected using appropriate equipment by qualified sample technicians following U.S. Environmental Protection Agency (EPA) surface water sampling protocols and industry standards for groundwater (*i.e.*, piezometer) sampling.

The samples were collected in laboratory-provided, pre-preserved, pre-labeled sample containers and placed on ice in a cooler under chain-of-custody control pending delivery to the laboratory for analysis. Samples for analysis by Pace Analytical Services, Inc. (PACE) of Huntersville, North Carolina were shipped to PACE via commercial overnight courier under chain-of-custody control. PACE and their subcontractor laboratories are Virginia Environmental Laboratory Accreditation Program (VELAP) accredited laboratories for the analyses performed. The results of the laboratory analyses for those constituents subject to numeric effluent limitations in the VPDES Permit are presented in Table 1.

The surface water samples S-1 through S-5 are representative of both the LAP Decant Water and Ash Pond Contact Stormwater quality prior to any additional treatment. Constituent concentrations measured in one or more of these samples (S-1 through S-5) exceeded the applicable CSWTS effluent limitations for internal Outfall 101 in the Station's VPDES permit.

The samples collected from the six piezometers (PZ-1 through PZ-6) are representative of the expected Ash Pond Ash Dewatering Water quality prior to any additional treatment. Constituent concentrations measured in one or more of these samples also exceeded the applicable CSWTS effluent limitations in the Station's VPDES permit.

4.0 TREATABILITY

In order to design a water treatment system that achieves the required effluent limitations in the Station's VPDES Permit, the selected water treatment vendor, ProAct Services Corporation (ProAct), completed a treatability study for the expected source waters to the CSWTS (see Appendix A). The study consisted of both bench-scale and pilot study tests examining expected influent levels, optimal chemical dosing, media effectiveness, and treatment process effectiveness. Bench-scale tests were used to evaluate proposed chemical usage and the effects of chemical dosing on ORP levels. The dosages that worked most effectively given the source water characteristics were recommended for implementation. A pilot study was used to test the proposed treatment system design as a whole and demonstrate efficacy of the overall system design. During the pilot study, various chemical injection blends were tested, and all of the media types were rotated in as the lead media to study the effects each media had on constituent removal. The pilot study was able to demonstrate the ability of the designed treatment process to achieve effluent concentrations below levels established in the Station's VPDES Permit.

The conclusion of the pilot study suggests that the proposed treatment process utilizing chemical oxidation/reduction, chemical coagulation, chemical flocculation, gravity settling, mechanical filtration, and enhanced treatment using media (as needed) will effectively treat the source waters as described in Section 2.0 to the required effluent limitations in the VPDES Permit. A treatment process flow diagram illustrating the conceptual treatment system design is shown in Drawing 4. The decision about which processes to run on any given day will be made based on influent quality, in-line process sampling, and/or best professional judgment to maximize treatment efficiency and effectiveness.

4.1 Collection System

At each pond location undergoing closure, a spill containment area (approximately 5 feet by 5 feet) will be constructed to house equipment to collect and transfer the source waters from the pond decanting/dewatering activities to the CSWTS. The equipment components of each collection and transfer system will generally include:

- High density polyethylene (HDPE) piping from the source pumps to the tank;
- Electric pump capable of conveying collected water to the CSWTS;

- Hoses, pipes, and fittings as required within the spill containment area, and;
- Alarm panel and overflow protection system.

Temporary influent storage tanks may be used as needed to accommodate periods of low-flow operations or peak contact stormwater generation to effectively manage influent source water quantities. Existing effluent tanks may be repurposed as influent storage tanks. Source waters may be routed directly to the influent storage tanks.

4.2 Treatment System and Storage Tank Components

The source waters from the collection systems will be conveyed for treatment to the CSWTS. Temporary equalization/storage capacity for the raw source water influent to the CSWTS may be utilized as necessary for effective wastewater management. The CSWTS and temporary storage tanks will be located in a spill containment area (approximately 350 feet by 500 feet). The CSWTS and temporary storage tank equipment will consist of the following components (some modifications to these specifications may be necessary in order to optimize treatment efficiency and/or accommodate reductions in wastewater flows as the project progresses):

- HDPE piping into the equalization/mix tanks;
- Five (5) chemical injection skids;
- Four (4) 15,000-gallon, equalization/mix tanks supplied with recirculation pumps, pH and ORP sensors, and rotary lobe transfer pumps;
- Two (2) chemical injection trailers with automated monitoring and chemical feed systems for the introduction of liquid coagulant and flocculent;
- Two (2) open top clarifiers with tapered bottom;
- Two (2) sludge handling systems each consisting of a diaphragm pump and four (4) 30 yard filter boxes with Geotubes®;
- Two (2) 21,000 gallon, equalization tanks with transfer pumps;
- Two (2) 21,000 gallon, backwash tanks with transfer pumps;
- Four (4) 4-48 sand filter skids;
- Six (6) duplex 8-bag filtration systems;
- Sixteen (16) fixed bed media filtration vessels;
- Eight (8) mechanical process flow meters with totalizers;
- Thirty-two (32) flow control valves;
- Two (2) 125 cfm Air Compressors
- Two (2) electric pumps capable of conveying stored water from the storage tanks for recirculation and discharge;
- One (1) master control panel located in the job trailer for project oversight and data logging;
- 1,000,000-gallon aboveground storage tanks (optional);
- Control wiring and power cables to the main electrical distribution panel, and from the main electrical distribution panel to the individual equipment skids;
- Alarm panel and overflow protection are incorporated in several areas of the CSWTS, and;
- Hoses, pipes, and fittings as required between the treatment system components as well as the temporary storage tanks within the spill containment berm.

4.3 Treatment Process

The CSWTS is designed as two parallel systems capable of treating up to 750 gallons per minute (gpm) each, for a total flow rate of up to 1,500 gpm through the treatment system. The following description of the treatment process and enhanced treatment is for one 750 gpm system, unless otherwise noted.

As source waters first enter the CSWTS, chemicals will be injected into the influent stream, as necessary. A list of chemicals that may be used (as needed) in the treatment process is provided in Table 2. Any chemical listed in Table 2 may be added at any location in the treatment system to enhance treatment and/or maintain the effluent limitations [e.g., pH within the range of 6-9 Standard Units (SU)]. The water will be pumped to two 15,000-gallon equalization/mix tanks in series. Chemicals will be injected in each tank as necessary, and equipment, such as pH and ORP sensors, will be used to monitor the water's properties. Recirculation pumps and/or mixers will be used to ensure proper mixing of the chemicals and water. The mixers and pumps will be turned on and off as needed. Pumps will be used to transfer the water from the second equalization/mix tank to a chemical injection trailer.

The chemical injection trailers will utilize automated monitoring and chemical feed systems to introduce liquid coagulant and flocculent into the water, as needed. A list of the coagulants and flocculants that may be added are included in Table 2. Coagulation will be used to change the electrical charge of the fine particles and cause the particles to destabilize. Flocculation will be used to bring the charged particles together and make them heavier, allowing for better settling out of the particles. Mixers may be installed within the chemical injection trailers to ensure proper mixing of the chemicals and the water, and the mixers will be turned on or off as needed.

After the chemical injection trailers, water will be conveyed to a clarifier for removal of suspended particles through the use of gravity, allowing heavier particles to settle out of the water over time. The solids that collect at the bottom of the clarifier will be pumped into 30 yard dewatering boxes containing Geotubes[®], which are geotextile bags used to facilitate dewatering and better handling of the solids material. The free water at the top of the dewatering boxes may be recirculated to the start of the treatment system, the clarifiers, or back to the source water storage area (i.e. influent tank, LAP, or UAP). The dewatered solids will be managed as a special waste under VSWMR and will be characterized as required by the VSWMR and the permitted disposal facility selected to receive the waste. The water will gravity feed from the clarifier into an equalization tank, before being recirculated for further treatment or storage, or pumped to the filtration systems.

A series of filtration systems will be used to purify the treated water. The filtration systems will begin with two 4-48 sand filters plumbed in parallel. The sand filters automatically backwash to help clear built-up particles removed from the water. The backwash water will be recycled to the LAP, directed to the optional influent storage tanks, or directed back to the start of the treatment system. Water from the sand filters will

then travel to bag filter systems designed to remove TSS, sediment, and filterable metals from the water. Two duplex 8-bag filter pods will be used, and the pods may run in series or parallel in order to maximize treatment. The micron rating of the filters used in the systems will be selected based on treatment needs. Spent filters will be disposed of in an approved landfill.

After the series of filtration systems, the treated water will pass through an in-line process sampling point (S1) before continuing on to the final bag filtration system, another duplex 8-bag filter pod. The micron rating of the filters used will be selected based on treatment needs, and spent filters will be disposed of in an approved landfill. Lastly, the treated water will be pumped to the optional effluent storage tanks, recirculated to the LAP, recirculated to the optional influent tanks, recirculated through the system for additional treatment, or pumped directly to discharge through internal Outfall 101.

If needed to meet the effluent limits in the VPDES Permit, optional media vessels containing any of the media listed in Table 3 may be added in any stage of the treatment process. Periodic sampling of the water at any point in the treatment process may be used to monitor constituent levels. Sampling of the final effluent will be conducted in accordance with the Station's VPDES Permit to comply with Parts I.A.2 and I.C.17. Storage capacity for the effluent from the CSWTS will be provided, as needed, to effectively manage the treated water, as described in Section 5.0. The storage of treated water in temporary effluent storage tanks allows Dominion the option to sample and analyze the water to ensure VPDES Permit compliance prior to discharge to internal Outfall 101. Internal Outfall 101 will be metered and sampled for compliance with the VPDES Permit. If effluent storage is used, effluent monitoring for compliance with the VPDES Permit will be performed on the effluent from the storage vessel(s). From internal Outfall 101, effluent will be routed to Outfall 001 or Outfall 002 for ultimate discharge.

4.4 Enhanced Treatment (if necessary)

Enhanced treatment includes the use of media and/or chemical addition, as necessary, for improved constituent removal. When process water is not being routed through enhanced treatment, in-line process samples will be collected at a minimum frequency of once every four hours at an in-line process sampling point (S1), and analytical results will be returned within approximately one (1) hour after sample collection. This sampling is in addition to the effluent compliance sampling required by the VPDES permit. If effluent from the treatment system exceeds any of the trigger concentrations presented below, as determined by the in-line process sampling and analysis from the in-line process sampling point (S1), then the effluent will be routed through enhanced treatment. The trigger concentrations are as follows:

- Arsenic – 100 micrograms per liter (ug/L)
- Antimony – 640 ug/L
- Selenium – 5.0 ug/L
- Thallium – 0.47 ug/L

- Lead – 7.4 ug/L
- Copper – 6.0 ug/L

The enhanced treatment may be turned off should the in-line process sampling and analysis determine that concentrations prior to the enhanced treatment are below the trigger limits. While enhanced treatment is used, in-line process sample collection is optional until the time in-line process sampling and analysis from the in-line process sample point (S1) is needed to indicate that concentrations prior to the enhanced treatment are below the trigger limits. Only after this indication will enhanced treatment be turned off. Dominion reserves the right to operate any component of the enhanced treatment system at any time even if trigger limits have not been exceeded.

A monthly report will be submitted to the DEQ that will provide the dates and times when enhanced treatment was turned on and off. The in-line process samples will be grab samples and will be analyzed using methods that will achieve the Quantification Levels (QLs) specified in the Station's VPDES Permit. A log will be maintained with the in-line process sampling results and the times that enhanced treatment begins and ends. The log will be available to the DEQ upon request.

Enhanced treatment may occur, as needed, directly after water passes through the in-line process sampling point (S1). Water will first pass a chemical injection point, and chemicals will be added, as needed. Next, the water will enter enhanced treatment trains set up to run in series or in parallel depending on treatment needs. Each enhanced treatment train will include a series of vessels that will be filled with media designed for targeted particulate removal. A list of media that may be used for enhanced treatment is provided in Table 3. The effluent may be routed through part or all of each treatment train, and the number of vessels in each enhanced treatment train may be adjusted (i.e., additional lead and/or lag vessels as needed), based on treatment needs. Any media listed in Table 3 may be added to any media vessel in the treatment system to enhance treatment and/or maintain the effluent limitations. Backwashing to clean out built-up particulates may be used to prolong the life of the media used during enhanced treatment. Backwash wastewater will be recirculated to the LAP, routed to the influent storage tanks, and/or routed to the start of the treatment system.

Periodic sampling of the effluent from the enhanced treatment process may be used to determine if dissolved metals breakthrough is occurring. This information will be used to determine when to replace the media, as well as determine the effectiveness of the enhanced treatment components.

5.0 STORAGE TANKS

Temporary effluent storage tanks may be used as an option to provide hydraulic retention of treated effluent prior to discharge (Drawing 5). The 1,000,000-gallon temporary aboveground storage tanks may be used in conjunction with the CSWTS. If used, the storage tanks will be erected southeast of the Station's generating facilities and north of Coxendale Road on Dominion property (see Drawing 2) and set on a

compacted aggregate base. The inside of the tanks will provide water-tight containment, and the prepared area will be provided with spill containment. Internal Outfall 101 will be the metered outfall compliance sampling location.

Process monitoring may be performed on the influent side of the tanks and/or within the tanks at various times to confirm the CSWTS is operating as designed to meet the VPDES permitted effluent limits prior to discharge. In the event that the process monitoring indicates the designed level of treatment is not being achieved, the stored effluent can then be recirculated back through the system for additional treatment or recirculated to the optional influent tanks or the LAP.

Effluent tanks may be repurposed as influent storage tanks to accommodate periods of low-flow operations or peak contact stormwater generation to effectively manage influent water quantities. An optional influent line may be used to transfer source waters as described in Section 2.0 to the optional influent storage tanks. The recirculation line may be used, as needed, to transfer the stored influent to the CSWTS.

END OF DOCUMENT

TABLES

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5	
								Unit	Result	Qualifier	Result																		
Aluminum																													
05/13-16/2016	E200.7	T					ug/L	1410		841		1270		1460		2480		7790		462		681		377		260		--	
05/13-16/2016	E200.7	D					ug/L	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	--		--		--		--		--	
05/25-26/2016	E200.7	T					ug/L	1100		441		5030		301		3500		805		706		580		733		606		--	
05/25-26/2016	E200.7	D					ug/L	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	--		--		--		--		--	
06/23/2016	E200.7	T					ug/L	371		< 50.0	U	72.8	J	< 50.0	U	< 50.0	U	< 50.0	U	426		152		< 50.0	U	145		--	
06/23/2016	E200.7	D					ug/L	< 50.0	U	< 50.0	U	51.2	J	< 50.0	U	< 50.0	U	< 50.0	U	53.9	J	152		< 50.0	U	137		--	
07/22/2016	E200.7	T					ug/L	157		1280		9770		2670		1080		1180		489		501		6450		1040		6450	
07/22/2016	E200.7	D					ug/L	< 50.0	U	51.0	J	51.2	J	< 50.0	U	788		1600		361		316		795		470		795	
Ammonia Nitrogen																													
05/13-16/2016	E350.1	N					mg/L	9.7		1.6		0.098	J	0.056	J	0.56		< 0.050	U	0.094	J	< 0.050	U	0.14		< 0.050	U	--	
05/25-26/2016	E350.1	N					mg/L	7.2		0.51		< 0.050	U	< 0.050	U	0.52		< 0.050	U	0.41		0.48		< 0.050	U	< 0.050	U	--	
Antimony																													
05/13-16/2016	E200.8	T	1300		1300		ug/L	< 0.50	U	1.2		< 0.50	U	< 0.50	U	< 0.50	U	0.96	J	4.6		4.8		< 0.50	U	7.5		--	
05/13-16/2016	E200.8	D	1300		1300		ug/L	< 0.50	U	1.2		< 0.50	U	--		--		--		--		--							
05/25-26/2016	E200.8	T	1300		1300		ug/L	< 0.50	U	< 2.5		< 2.5	U	< 0.50	U	< 2.5	U	< 0.50	U	4.8		5.3		< 0.50	U	7.6		--	
05/25-26/2016	E200.8	D	1300		1300		ug/L	< 0.50	U	< 1.0	U	< 1.0	U	< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--	
06/23/2016	E200.8	T	1300		1300		ug/L	< 0.50	U	< 0.50	U	1.6		< 0.50	U	< 0.50	U	< 0.50	U	6.8		8.6		< 0.50	U	14.9		--	
06/23/2016	E200.8	D	1300		1300		ug/L	< 0.50	U	< 0.50	U	1.7		< 0.50	U	< 0.50	U	< 0.50	U	6.9		8.5		< 0.50	U	15.4		--	
07/22/2016	E200.8	T	1300		1300		ug/L	< 0.50	U	< 0.50	U	5.0		< 0.50	U	< 0.50	U	< 0.50	U	8.5		8.7		10.9		11.7		10.9	
07/22/2016	E200.8	D	1300		1300		ug/L	< 0.50	U	< 0.50	U	1.0		< 0.50	U	< 0.50	U	< 0.50	U	9.0		8.7		10.2		11.8		10.2	
Arsenic																													
05/13-16/2016	E200.8	T	440		240		ug/L	34.8		736		1500		2470		918		75.2		33.6		31.0		16.6		35.0		--	
05/13-16/2016	E200.8	D	440		240		ug/L	1.0		209		1020		316		52.4		2.0		--		--		--		--		--	
05/25-26/2016	E200.8	T	440		240		ug/L	27.5		1080		1210		3020		1080		49.3		31.7		27.6		14.1		37.0		--	
05/25-26/2016	E200.8	D	440		240		ug/L	< 0.50	U	593		825		387		182		6.2		--		--		--		--		--	
06/23/2016	E200.8	T	440		240		ug/L	74.9		1110		442		2880		1390		53.6		73.1		53.7		11.8		50.3		--	
06/23/2016	E200.8	D	440		240		ug/L	67.0		1170		444		3030		1450		57.1		71.6		53.4		11.6		51.8		--	
07/22/2016	E200.8	T	440		240		ug/L	182		866		425		2810		1220		57.4		73.2		72.7		86.2		26.7		86.2	
07/22/2016	E200.8	D	440		240		ug/L	77.6		927		942		2800		1230		57.4		72.2		74.0		71.3		24.5		71.3	
Barium																													
05/13-16/2016	E200.7	T					ug/L	255		130		326		786		107		277		236		188		24.2		69.7		--	
05/13-16/2016	E200.7	D					ug/L	135		103		271		504		46.7		41.5		--		--		--		--		--	
05/25-26/2016	E200.7	T					ug/L	238		295		296		663		132		63.3		186		184		24.5		70.4		--	
05/25-26/2016	E200.7	D					ug/L	219		250		208		464		45.3		38.2		--		--		--		--		--	
06/23/2016	E200.7	T					ug/L	255		573		120		716		52.0		36.3		223		223		57.6		70.0		--	
06/23/2016	E200.7	D					ug/L	232		527		113		678		49.9		36.7		213		218		56.8		70.5		--	
07/22/2016	E200.7	T					ug/L	140		517		309		780		78.6		77.0		319		318		335		76.6		335	
07/22/2016	E200.7	D					ug/L	247		680		196		736		69.9		98.0		314		308		242		64.2		242	

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5		
							Unit	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result												
Beryllium																														
05/13-16/2016	E200.7	T					ug/L	-		< 0.50	U	< 0.50	U	0.51	J	0.90	J	2.5		< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	-		
05/13-16/2016	E200.7	D					ug/L	< 0.50	U	-		-		-		-		-		-										
05/25-26/2016	E200.7	T					ug/L	< 0.50	U	< 0.50	U	1.6		< 0.50	U	1.5		< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	-		-
05/25-26/2016	E200.7	D					ug/L	< 0.50	U	-		-		-		-		-		-										
06/23/2016	E200.7	T					ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	-		-												
06/23/2016	E200.7	D					ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	-		-												
07/22/2016	E200.7	T					ug/L	< 0.50	U	< 0.50	U	2.1		0.62	J	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	1.4		1.4
07/22/2016	E200.7	D					ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50
Boron																														
05/13-16/2016	E200.7	T					ug/L	818		3050		4730		2020		2870		1800		2730		2710		100		792		-		-
05/13-16/2016	E200.7	D					ug/L	742		2870		4590		1840		2830		1800		-		-		-		-		-		-
05/25-26/2016	E200.7	T					ug/L	1630		3410		4530		2010		3180		1830		2500		2570		103		798		-		-
05/25-26/2016	E200.7	D					ug/L	1630		3250		4230		1900		2930		1800		-		-		-		-		-		-
06/23/2016	E200.7	T					ug/L	1680		3200		2370		1740		2340		1710		3100		3380		157		1960		-		-
06/23/2016	E200.7	D					ug/L	1710		3200		2450		1810		2420		1700		3000		3290		160		1940		-		-
07/22/2016	E200.7	T					ug/L	2480		3860		3840		1940		2450		1830		3410		3450		1650		3220		1650		1650
07/22/2016	E200.7	D					ug/L	1980		3660		3850		1940		2460		1770		3460		3380		1450		3160		1450		1450
Cadmium																														
05/13-16/2016	E200.8	T	2.6		1.4		ug/L	0.090	J	< 0.050	U	0.099	J	< 0.050	U	< 0.050	U	0.12		0.57		0.34		< 0.050	U	< 0.050	U	-		-
05/13-16/2016	E200.8	D	2.6		1.4		ug/L	< 0.050	U	-		-		-		-		-		-		-								
05/25-26/2016	E200.8	T	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	0.12		< 0.050	U	0.11		< 0.050	U	0.32		-		< 0.050	U	< 0.050	U	-		-
05/25-26/2016	E200.8	D	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	0.095	J	< 0.050	U	< 0.050	U	< 0.050	U	-		-		-		-		-		-
06/23/2016	E200.8	T	2.6		1.4		ug/L	0.061	J	< 0.050	U	0.48		0.39		< 0.050	U	0.064	J	-		-								
06/23/2016	E200.8	D	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	0.50		0.38		< 0.050	U	< 0.050	U	-		-
07/22/2016	E200.8	T	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	< 0.25	U	< 0.10	U	0.060	J	< 0.050	U	0.20		0.20		0.16	J	0.10		0.16	J	0.16
07/22/2016	E200.8	D	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	0.15		0.18		< 0.050	U	0.069	J	< 0.050	U	< 0.050
Carbon																														
05/13-16/2016	SM5310B	N	110				mg/L	15.5		0.73	J	2.4		0.54	J	< 0.50	U	0.90	J	1.9		2.2		6.7		1.1		-		-
05/25-26/2016	SM5310B	N	110				mg/L	11.8		1.1		2.3		0.72	J	< 0.50	U	< 0.50	U	1.4		1.5		5.9		1.9		-		-
06/23/2016	SM5310B	N	110				mg/L	4.5		1.7		2.8		0.56	J	0.51	J	< 0.50	U	1.2		1.2		5.8		2.0		-		-
07/22/2016	SM5310B	N	110				mg/L	3.4		1.1		1.2		0.56	J	< 0.50	U	< 0.50	U	1.1		0.94	J	0.84	J	3.7		0.84	J	0.84
Chloride																														
05/13-16/2016	SM4500-Cl-E	N	660		360		mg/L	105		146		60.6		11.7		235		210		246		209		3.4		25.9		-		-
05/25-26/2016	SM4500-Cl-E	N	660		360		mg/L	227		121		62.7		18.3		204		188		183		200		3.0		21.8		-		-
06/23/2016	SM4500-Cl-E	N	660		360		mg/L	274		116		54.9		14.3		199		183		278		295		3.3		78.1		-		-
07/22/2016	SM4500-Cl-E	N	660		360		mg/L	278		119		106		15.2		222		171		287		278		187		215		187		187
Chlorine, Total Residual¹																														
06/23/2016	FIELD	N	0.032		0.018		mg/L	0.04		0.04		0.06		0.05		< 0.01		0.02		0.03		< 0.01		< 0.01		0.05		-		-
07/22/2016	FIELD	N	0.032		0.018		mg/L	0.02		0.02		0.09		< 0.01		< 0.01		< 0.01		< 0.01		< 0.01		< 0.01		0.02		-		-
02/06-21/2017	FIELD	N	0.032		0.018		mg/L	0.00		0.00		-		< 0.003		-		< 0.003		< 0.003		-		-		0.00		-		-

Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location		PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5				
							Unit	Result	Qualifier																								
Chromium																																	
05/13-16/2016	E200.8	T					ug/L	2.5		0.97	J	1.8		1.9		2.6		7.3		5.1		6.7		0.81	J	11.4		--					
05/13-16/2016	E200.8	D					ug/L	< 0.50	U	--		--		--		--		--															
05/25-26/2016	E200.8	T					ug/L	2.4		1.2		6.3		< 0.50	U	4.1		0.84	J	9.7		10.1		1.9		12.1		--					
05/25-26/2016	E200.8	D					ug/L	< 0.50	U	--		--		--		--		--															
06/23/2016	E200.8	T					ug/L	0.99	J	< 0.50	U	0.72	J	< 0.50	U	< 0.50	U	< 0.50	U	2.7		3.9		< 0.50	U	40.0		--					
06/23/2016	E200.8	D					ug/L	< 0.50	U	< 0.50	U	0.75	J	< 0.50	U	< 0.50	U	< 0.50	U	2.0		3.9		< 0.50	U	41.4		--					
07/22/2016	E200.8	T					ug/L	0.63	J	1.4		12.1		3.1		1.4		1.5		4.7		4.6		< 0.50	U	24.4		24.4					
07/22/2016	E200.8	D					ug/L	< 0.50	U	0.61	J	< 0.50	U	< 0.50	U	1.1		2.1		4.2		4.2		--		11.6		17.7					
Chromium (III)																																	
06/23/2016	CALC	T	0.19		0.10		mg/L	< 0.0025	U	--																							
06/23/2016	CALC	D	0.19		0.10		mg/L	< 0.0025	U	--																							
07/22/2016	CALC	T	0.19		0.10		mg/L	< 0.0025	U	< 0.0025	U	0.012		0.0031	J	< 0.0025	U	0.0071		< 0.0025	U	0.0071											
07/22/2016	CALC	D	0.19		0.10		mg/L	< 0.0025	U																								
Cobalt																																	
05/13-16/2016	E200.7	T					ug/L	10.3		< 5.0	U	6.6	J	< 5.0	U	--																	
05/13-16/2016	E200.7	D					ug/L	7.9	J	< 5.0	U	--		--		--		--		--													
05/25-26/2016	E200.7	T					ug/L	14.3		< 5.0	U	--																					
05/25-26/2016	E200.7	D					ug/L	12.3		< 5.0	U	--		--		--		--		--													
06/23/2016	E200.7	T					ug/L	14.9		< 5.0	U	6.2	J	< 5.0	U	--																	
06/23/2016	E200.7	D					ug/L	14.1		< 5.0	U	5.3	J	< 5.0	U	--																	
07/22/2016	E200.7	T					ug/L	25.5		< 5.0	U	7.1	J	< 5.0	U	5.0	J	< 5.0	U	5.0	J	5.0	J										
07/22/2016	E200.7	D					ug/L	12.8		< 5.0	U																						
Conductivity, field measured																																	
05/13-16/2016	FIELD	N					uS/cm	1380		1552.2		1011		1070		2393		1371.4		972.6		1073.7		124.2		952.6		--					
05/25-26/2016	FIELD	N					uS/cm	1105.8		1760.2		959.9		874		2268.3		1140		949.7		928.6		114.4		366.5		--					
06/23/2016	FIELD	N					uS/cm	1643		1803.5		604.4		1103		2653.4		1452.2		1368		1468		265.9		1352.9		--					
07/22/2016	FIELD	N					uS/cm	1500		1452		762.5		876.0		2151		1251		761.7		761.8		2131		948		--					
Copper																																	
05/13-16/2016	E200.8	T	20		11		ug/L	2.3		2.2		3.3		4.1		5.7		17.0		4.2		2.7		1.8		0.93	J	--					
05/13-16/2016	E200.8	D	20		11		ug/L	< 0.50	U	--		--		--		--		--															
05/25-26/2016	E200.8	T	20		11		ug/L	2.2		0.99	J	10.4		0.81	J	9.2		1.7		3.8		3.6		2.2		2.0		--					
05/25-26/2016	E200.8	D	20		11		ug/L	< 0.50	U	--		--		--		--		--															
06/23/2016	E200.8	T	20		11		ug/L	1.0		< 0.50	U	2.9		1.3		< 0.50	U	0.54	J	--													
06/23/2016	E200.8	D	20		11		ug/L	0.68	J	< 0.50	U	1.5		1.3		< 0.50	U	0.63	J	--													
07/22/2016	E200.8	T	20		11		ug/L	< 0.50	U	2.5		22.6		7.0		3.4		2.6		2.6		1.8		16.1		2.3		16.1					
07/22/2016	E200.8	D	20		11		ug/L	< 0.50	U	< 0.50	U	10.0		< 0.50	U	2.1		3.7		0.90	J	0.98	J	1.5		0.71	J	1.5					
Diesel Range Organics																																	
06/23/2016	SW8015M	N					mg/L	0.11	J	< 0.10	U	0.13	J	< 0.10	U	--																	
Diesel Range Organics (C10-C28)																																	
05/13-16/2016	SW8015M	N					mg/L	< 0.10	U	--																							
05/25-26/2016	SW8015M	N					mg/L	< 0.10	U	0.17	J	< 0.10	U	--																			
07/22/2016	SW8015M	N					mg/L	< 0.10	U																								

Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station

Sample Date	Method	Fracton	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location		PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5				
							Unit	Result	Qualifier																								
Dissolved Oxygen, field measured																																	
05/13-16/2016	FIELD	N					mg/L	3.68		1.26		1.04		1.77		3.8		3.34		9.17		8.18		10.02		9.15		--					
05/25-26/2016	FIELD	N					mg/L	3.89		1.51		1.59		2.36		1.90		2.90		7.54		7.51		8.58		7.88		--					
06/23/2016	FIELD	N					mg/L	2.74		2.42		6.71		2.57		5.02		3.97		3.24		8.09		6.57		6.71		--					
07/22/2016	FIELD	N					mg/L	1.80		2.47		2.14		1.81		2.32		2.84		8.01		9.41		9.14		7.07		--					
Gasoline (C6-C10)																																	
07/22/2016	SW8015M	N					mg/L	0.027	J	0.019	J	0.089		0.030	J	0.026	J	0.064	J	0.021	J	0.025	J	0.027	J	0.045	J	0.027	J				
Gasoline Range Organics																																	
06/23/2016	SW8015M	N					mg/L	< 0.016	U	< 0.016	U	0.035	J	< 0.016	U	--																	
Hardness, Calcium and Magnesium																																	
05/13-16/2016	E200.7	T					ug/L	298000		1180000		570000		547000		1380000		513000		399000		399000		50400		579000		--					
05/25-26/2016	E200.7	T					ug/L	414000		1010000		537000		462000		1330000		--		343000		356000		48300		492000		--					
07/22/2016	E200.7	T					ug/L	541000		878000		506000		512000		1360000		488000		470000		480000		263000		1410000		263000					
Hexavalent Chromium																																	
05/13-16/2016	E218.7	N	32		17		ug/L	0.74	J	1.4	J	< 0.010	U	5.3		6.9		0.039		15.3		--											
05/25-26/2016	E218.7	N	32		17		ug/L	< 0.50	U	< 0.10	U	< 0.10	U	< 0.50	U	< 0.10	U	< 0.50	U	9.4		9.2		0.033		12.2		--					
06/23/2016	E218.7	N	32		17		ug/L	< 0.50	U	< 0.010	U	5.0		< 0.10	U	< 0.10	U	0.36	J	2.2		5.4		0.016	J	75.2		--					
06/23/2016	E218.7	D	32		17		ug/L	< 0.50	U	< 0.010	U	0.67		< 0.10	U	< 0.10	U	< 0.20	U	1.7		3.4		< 0.010	U	42.1		--					
07/22/2016	E218.7	N	32		17		ug/L	< 0.50	U	< 0.010	U	0.011	J	< 0.50	U	4.0		6.7		3.6		3.9		17.3		12.0		17.3					
07/22/2016	E218.7	D	32		17		ug/L	< 0.20	U	< 0.010	U	< 0.010	U	7.8		4.3		5.9		4.0		3.7		17.3		12.6		17.3					
Iron																																	
05/13-16/2016	E200.7	T					ug/L	60000		4520		3000		22000		16100		43600		183		107		735		49.9		--					
05/13-16/2016	E200.7	D					ug/L	2930		< 20.0	U	16900		--		--		--		--		--											
05/25-26/2016	E200.7	T					ug/L	51000		4110		3550		28000		13800		39800		188		182		769		223		--					
05/25-26/2016	E200.7	D					ug/L	3010		< 20.0	U	< 20.0	U	< 20.0	U	478		24500		--		--		--		--		--					
06/23/2016	E200.7	T					ug/L	52800		2170		< 20.0	U	30000		15500		47700		170		< 20.0	U	< 20.0	U	< 20.0	U	--					
06/23/2016	E200.7	D					ug/L	46800		1870		< 20.0	U	26800		13800		46800		< 20.0	U	--											
07/22/2016	E200.7	T					ug/L	20800		1360		3930		31000		15200		61100		75.9		84.5		2150		430		2150					
07/22/2016	E200.7	D					ug/L	46300		1160		1420		29200		15200		59900		25.4	J	< 20.0	U										
Lead																																	
05/13-16/2016	E200.8	T	31		17		ug/L	1.9		1.1		1.9		2.1		4.0		9.4		0.53	J	< 0.50	U	0.55	J	< 0.50	U	--					
05/13-16/2016	E200.8	D	31		17		ug/L	< 0.50	U	--		--		--		--		--															
05/25-26/2016	E200.8	T	31		17		ug/L	1.5		0.66	J	7.9		< 0.50	U	5.9		1.0		0.60	J	0.55	J	0.78	J	0.93	J	--					
05/25-26/2016	E200.8	D	31		17		ug/L	< 0.50	U	--		--		--		--		--															
06/23/2016	E200.8	T	31		17		ug/L	0.56	J	< 0.50	U	0.69	J	< 0.50	U	< 0.50	U	< 0.50	U	--													
06/23/2016	E200.8	D	31		17		ug/L	< 0.50	U	--																							
07/22/2016	E200.8	T	31		17		ug/L	< 0.50	U	1.7		13.7		3.9		1.8		1.4		< 0.50	U	< 0.50	U	6.9		0.92	J	6.9					
07/22/2016	E200.8	D	31		17		ug/L	< 0.50	U	1.3		2.0		< 0.50	U																		
Mercury																																	
05/13-16/2016	E245.1	T	2.2		1.2		ug/L	< 0.070	U	--																							
05/13-16/2016	E245.1	D	2.2		1.2		ug/L	< 0.090	U	--		--		--		--		--															
05/25-26/2016	E245.1	T	2.2		1.2		ug/L	< 0.070	U	--																							
05/25-26/2016	E245.1	D	2.2		1.2		ug/L	< 0.090	U	--		--		--		--		--															
06/23/2016	E245.1	T	2.2		1.2		ug/L	< 0.070	U	--																							
06/23/2016	E245.1	D	2.2		1.2		ug/L	< 0.090	U	--																							
07/22/2016	E245.1	T	2.2		1.2		ug/L	< 0.070	U	< 0.070	U	0.098	J	< 0.070	U	0.077	J	< 0.070	U	0.077	J												
07/22/2016	E245.1	D	2.2		1.2		ug/L	< 0.090	U																								

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5			
								Unit	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result														
Molybdenum																															
05/13-16/2016	E200.7	T					ug/L	29.9		266		864		86.2		188		< 5.0	U	76.0		87.3		< 5.0	U	91.6		--			
05/13-16/2016	E200.7	D					ug/L	14.8		259		860		83.2		169		< 5.0	U	--		--		--		--		--			
05/25-26/2016	E200.7	T					ug/L	29.2		216		649		98.9		263		< 5.0	U	77.5		87.9		< 5.0	U	87.1		--			
05/25-26/2016	E200.7	D					ug/L	< 5.0	U	229		654		98.5		249		< 5.0	U	--		--		--		--		--			
06/23/2016	E200.7	T					ug/L	25.0		140		199		101		319		< 5.0	U	99.9		121		< 5.0	U	370		--			
06/23/2016	E200.7	D					ug/L	21.3		129		188		95.4		308		< 5.0	U	101		120		< 5.0	U	375		--			
07/22/2016	E200.7	T					ug/L	72.4		60.9		257		106		272		< 5.0	U	124		123		193		442		193			
07/22/2016	E200.7	D					ug/L	15.3		83.5		367		107		270		< 5.0	U	122		120		167		436		167			
Nickel																															
05/13-16/2016	E200.8	T	48		26		ug/L	5.0		2.8		4.6		3.2		3.6		11.0		14.5		11.3		0.94	J	2.8		--			
05/13-16/2016	E200.8	D	48		26		ug/L	3.0		2.0		3.0		1.4		0.96	J	2.3		--		--		--		--		--			
05/25-26/2016	E200.8	T	48		26		ug/L	4.7		1.8		8.2		0.76	J	4.0		2.3		10.6		11.9		1.2		2.3		--			
05/25-26/2016	E200.8	D	48		26		ug/L	3.5		1.2		2.5		< 0.62	U	< 0.62	U	1.6		--		--		--		--		--			
06/23/2016	E200.8	T	48		26		ug/L	4.5		1.3		1.4		< 0.62	U	0.89	J	1.1		15.6		13.6		0.68	J	3.1		--			
06/23/2016	E200.8	D	48		26		ug/L	3.7		1.4		1.6		0.69	J	0.90	J	1.3		14.7		13.8		< 0.62	U	3.5		--			
07/22/2016	E200.8	T	48		26		ug/L	7.8		2.7		15.9		4.9		2.1		2.6		9.4		9.5		11.2		4.4		11.2			
07/22/2016	E200.8	D	48		26		ug/L	3.7		1.2		2.0		0.78	J	1.9		3.5		7.1		7.9		4.9		3.7		4.9			
Nitrogen																															
06/23/2016	CALC	N					mg/L	5.8		1.2		0.79		< 0.12	U	0.70		0.15		1.4		1.7		0.67		69.8		--			
07/22/2016	CALC	N					mg/L	4.0		0.85		< 0.12	U	< 0.12	U	0.50		< 0.12	U	1.3		1.4		1.9		1.5		1.9			
07/22/2016	E351.2	N					mg/L	4.0		0.85		< 0.25	U	< 0.25	U	0.50		< 0.25	U	0.28	J	0.39	J	1.8		1.5		1.8			
Nitrogen, Nitrate-Nitrite																															
06/23/2016	E353.2	N					mg/L	< 0.010	U	< 0.010	U	0.046		< 0.010	U	< 0.010	U	< 0.010	U	1.2		1.2		< 0.010	U	0.62		--			
07/22/2016	E353.2	N					mg/L	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	0.97		0.96		0.18		< 0.010	U	0.18			
Nitrogen, Total Kjeldahl																															
06/23/2016	E351.2	N					mg/L	5.8		1.2		0.74		< 0.25	U	0.70		< 0.25	U	< 0.25	U	0.49	J	0.67		69.2		--			
Oil & Grease, Total Rec																															
05/13-16/2016	E1664B	N	20.0		15.0		mg/L	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	--	
05/25-26/2016	E1664B	N	20.0		15.0		mg/L	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	--	
06/23/2016	E1664B	N	20.0		15.0		mg/L	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	--	
07/22/2016	E1664B	N	20.0		15.0		mg/L	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U
Oxidation Reduction Potential, field measured																															
05/13-16/2016	FIELD	N					millivolts	-31.3		-142.6		-131.7		-108.3		-48.7		-64.4		79.0		77.2		22.2		114.4		--			
05/25-26/2016	FIELD	N					millivolts	-106.5		-158.3		-190.2		-170.9		-123.2		-90.9		44.3		71.9		33.5		31.5		--			
06/23/2016	FIELD	N					millivolts	141.5		-193.2		-32.8		-203.5		-162.9		-84.7		-18.8		-24.6		-15.8		0		--			
07/22/2016	FIELD	N					millivolts	-86.6		-173.2		-82.7		-141.1		-100.4		-39.3		28.5		47.6		-32.8		-12.3		--			
pH, field measured																															
05/13-16/2016	FIELD	N	9.0	6.0	9.0	6.0	SU	6.43		7.90		7.56		6.71		6.86		6.74		8.38		8.48		9.63		8.25		--			
05/25-26/2016	FIELD	N	9.0	6.0	9.0	6.0	SU	6.73		7.61		8.01		7.44		7.26		6.95		7.89		7.87		8.98		7.97		--			
06/23/2016	FIELD	N	9.0	6.0	9.0	6.0	SU	6.55		7.58		8.13		7.05		7.07		6.06		6.64		7.72		7.55		7.64		--			
07/22/2016	FIELD	N	9.0	6.0	9.0	6.0	SU	6.56		7.96		7.62		7.08		6.93		6.29		8.27		8.43		8.52		8.38		--			
Phosphorus																															
06/23/2016	E365.1	N					mg/L	0.68		0.53		1.2		0.35		0.14		0.051		< 0.025	U	< 0.025	U	0.027	J	0.19		--			
07/22/2016	E365.1	N					mg/L	0.81		0.30		0.21		0.16		0.14		0.069		0.050		0.056		0.88		0.065		0.88			

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5			
								Unit	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Selenium																															
05/13-16/2016	E200.8	T	14		7.7		ug/L	0.54	J	< 0.50	U	0.76	J	0.64	J	0.84	J	2.1		16.1		19.6		1.9		155		--			
05/13-16/2016	E200.8	D	14		7.7		ug/L	< 0.50	U	< 0.50	U	0.96	J	< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--			
05/25-26/2016	E200.8	T	14		7.7		ug/L	< 0.50	U	< 0.50	U	2.7		< 0.50	U	1.3		< 0.50	U	34.5		34.3		1.5		160		--			
05/25-26/2016	E200.8	D	14		7.7		ug/L	< 0.50	U	< 0.50	U	3.5		< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--			
06/23/2016	E200.8	T	14		7.7		ug/L	< 0.50	U	< 0.50	U	9.5		< 0.50	U	< 0.50	U	< 0.50	U	27.4		29.5		1.1		370		--			
06/23/2016	E200.8	D	14		7.7		ug/L	< 0.50	U	< 0.50	U	9.0		< 0.50	U	< 0.50	U	< 0.50	U	27.5		29.0		1.2		377		--			
07/22/2016	E200.8	T	14		7.7		ug/L	< 0.50	U	0.71	J	12.6		0.83	J	0.57	J	< 0.50	U	41.3		41.6		44.4		242		44.4			
07/22/2016	E200.8	D	14		7.7		ug/L	< 0.50	U	< 0.50	U	1.5		< 0.50	U	< 0.50	U	0.67	J	42.3		41.6		40.2		239		40.2			
Silver																															
05/13-16/2016	E200.8	T	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	--	
05/25-26/2016	E200.8	T	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	--	
06/23/2016	E200.8	T	5.0		2.7		ug/L	--		< 0.25	U	--		< 0.25	U	< 0.25	U	--		--		--		--		--		--			
06/23/2016	E200.8	D	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	--	
07/22/2016	E200.8	T	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.25	U	< 0.10	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.10	U	< 0.050	U	< 0.10	U	< 0.10	U
07/22/2016	E200.8	D	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U
Sulfate																															
05/13-16/2016	E300	N					mg/L	85.8		834		154		61.8		1000		374		142		148		8.0		472		--			
05/25-26/2016	E300	N					mg/L	219		655		254		41.8		1020		360		151		152		8.4		411		--			
Temperature, field measured																															
05/13-16/2016	FIELD	N					C	23.8		19.08		17.4		16.1		20.3		17.61		26.47		27.20		25.15		24.78		--			
05/25-26/2016	FIELD	N					C	26.33		24.20		22.98		21.09		21.84		2533		30.73		31.14		25.01		31.10		--			
06/23/2016	FIELD	N					C	22.76		25.41		20.32		18.56		22.76		25.60		25.31		28.25		25.51		27.38		--			
07/22/2016	FIELD	N					C	23.1		22.0		19.1		17.3		20.9		20.3		32.5		33.8		33.3		33.4		--			
Thallium																															
05/13-16/2016	E200.8	T	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	0.62	J	1.3		1.1		< 0.50	U	0.82	J	--			
05/13-16/2016	E200.8	D	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--			
05/25-26/2016	E200.8	T	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	0.90	J	1.0		< 0.50	U	0.80	J	--			
05/25-26/2016	E200.8	D	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--			
06/23/2016	E200.8	T	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	0.66	J	< 0.50	U	< 0.50	U	< 0.50	U	1.0		1.3		< 0.50	U	1.5		--			
06/23/2016	E200.8	D	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	0.68	J	< 0.50	U	< 0.50	U	< 0.50	U	0.98	J	1.3		< 0.50	U	1.5		--			
07/22/2016	E200.8	T	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	1.7		< 0.50	U	< 0.50	U	< 0.50	U	1.3		1.3		1.2		1.7		1.2			
07/22/2016	E200.8	D	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	1.3		1.3		0.80	J	1.5		0.80	J		
Total Dissolved Solids																															
05/13-16/2016	SM2540C	D					mg/L	711		1580		622		596		1990		439		702		751		67.0		836		--			
05/25-26/2016	SM2540C	D					mg/L	668		1450		731		556		1870		1010		625		697		125		726		--			
Total Suspended Solids																															
05/13-16/2016	SM2540D	N	100		30		mg/L	154		10.2		8.1		8.3		146		332		163		15.8		206		2.3		--			
05/25-26/2016	SM2540D	N	100		30		mg/L	62.7		19.4		116		73.2		194		19.6		3.9		5.0		21.3		6.2		--			
06/23/2016	SM2540D	N	100		30		mg/L	27.6		589		528		281		81.8		288		10.5		6.5		4.1		500		--			
07/22/2016	SM2540D	N	100		30		mg/L	53.0		29.5		248		606		174		411		9.4		4.3		390		35.2		390			
Turbidity, field measured																															
05/13-16/2016	FIELD	N					ntu	218.3		>1000		3190		96		3524.9		443		10.6		8.38		10.3		11.7		--			
05/25-26/2016	FIELD	N					ntu	35		28.3		51.6		10.2		9.56		11.6		8.74		9.7		16.5		20.7		--			
07/22/2016	FIELD	N					ntu	47.8		199.5		66.9		102.1		250.9		81.1		443.9		204.1		20.1		270.3		--			

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5	
							Unit	Result	Qualifier																				
Vanadium																													
05/13-16/2016	E200.7	T					ug/L	< 5.0	U	< 5.0	U	6.9	J	10.0		9.9	J	31.1		22.3		25.3		< 5.0	U	45.8		--	
05/13-16/2016	E200.7	D					ug/L	< 5.0	U	--		--		--		--		--											
05/25-26/2016	E200.7	T					ug/L	< 5.0	U	< 5.0	U	29.2		< 5.0	U	18.0		< 5.0	U	38.0		35.4		< 5.0	U	46.4		--	
05/25-26/2016	E200.7	D					ug/L	< 5.0	U	< 5.0	U	5.4	J	< 5.0	U	< 5.0	U	< 5.0	U	--		--		--		--		--	
06/23/2016	E200.7	T					ug/L	< 5.0	U	< 5.0	U	50.4		< 5.0	U	< 5.0	U	< 5.0	U	34.3		34.8		< 5.0	U	76.6		--	
06/23/2016	E200.7	D					ug/L	< 5.0	U	< 5.0	U	53.8		< 5.0	U	< 5.0	U	< 5.0	U	31.4		34.9		< 5.0	U	76.3		--	
07/22/2016	E200.7	T					ug/L	< 5.0	U	6.1	J	101		24.0		6.5	J	6.4	J	54.4		53.9		83.3		103		83.3	
07/22/2016	E200.7	D					ug/L	< 5.0	U	< 5.0	U	16.8		< 5.0	U	5.0	J	7.4	J	51.8		51.8		58.7		95.5		58.7	
Zinc																													
05/13-16/2016	E200.8	T	190		100		ug/L	29.0		6.5		4.8	J	3.4	J	4.3	J	13.4		15.5		10.5		2.7	J	< 2.5	U	--	
05/13-16/2016	E200.8	D	190		100		ug/L	8.1		< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	3.2	J	--		--		--		--		--	
05/25-26/2016	E200.8	T	190		100		ug/L	21.6		2.5	J	11.0		10.3		6.4		3.0	J	8.2		8.2		7.4		2.5	J	--	
05/25-26/2016	E200.8	D	190		100		ug/L	5.3		< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	--		--		--		--		--	
06/23/2016	E200.8	T	190		100		ug/L	5.2		< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	10.2		< 2.5	U	< 2.5	U	< 2.5	U	--	
06/23/2016	E200.8	D	190		100		ug/L	8.9		< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	8.0		3.0	J	< 2.5	U	< 2.5	U	--	
07/22/2016	E200.8	T	190		100		ug/L	4.9	J	3.0	J	20.3		8.4	J	3.4	J	4.3	J	6.0		3.9	J	14.7		3.6	J	14.7	
07/22/2016	E200.8	D	190		100		ug/L	3.1	J	< 2.5	U	12.3		< 2.5	U	< 2.5	U	5.6		< 2.5	U	< 2.5	U	3.0	J	6.4		3.0	J

¹ The original analyses completed 6/23/2016 and 7/22/2016 used untreated samples and a colorimetric method subject to a number of interferences. The results were believed to be false-positives. Additional analyses completed 02/06-21/2017 used samples treated to remove selected interferences as well as a titration method. The results of the 02/06-21/2017 analyses confirmed the earlier 6/23/2016 and 7/22/2016 results were false-positives associated with one or more interferences in the water sample.

Table 2
Centralized Source Water Treatment System Process Chemicals and Polymers
Chesterfield Power Station

Process Category	Type
<u>Oxidation Chemicals</u>	Sodium Hypochlorite Hydrogen Peroxide
<u>Coagulants</u>	Ferric Chloride Ferrous Chloride Alum Sodium Sulfide
<u>Flocculants</u>	HaloKlear LBP 2101 HaloKlear BHR P50 Polyacrylamides
<u>pH Adjustment Chemicals</u>	Sodium Hydroxide Hydrochloric Acid Potassium Hydroxide Sulfuric Acid Lime
<u>Reducing Agents</u>	Sodium Sulfite Ferrous Sulfate Ferric Sulfate Sodium Metabisulfite Sodium Thiosulfate Calcium Thiosulfate Sodium Bisulfate Ascorbic Acid Sodium Ascorbate Ferrous Hydroxide
<u>Precipitation Chemicals</u>	Calcium Hydroxide Barium Chloride Barium Carbonate

Table 3
Centralized Source Water Treatment System Process Medias
Chesterfield Power Station

Process Category	Type
<u>Medias</u>	Activated Alumina Chabazite Zeolite Purolite A-100 Purolite C104Na ASG AM ProAct S6 Resin Purolite FerrIX A33E Resin Granular Activated Carbon (GAC) Zero-Valent Iron (ZVI)

DRAWINGS

C:\Plan Production Data Files\Drawing Data Files\15-206100 - CER Drawings (Dec. 2016)\Active Drawings\1520610001.dwg | Layout: DWG | Modified: SBarry 05/22/2017 4:15 PM | Plotted: SBarry 05/22/2017



AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO ON 6/20/16.
MAP DATA BY: GOOGLE. IMAGERY DATE: 04/05/16



REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
PROJECT						
DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE						
STATION OUTFALLS AND FACILITIES						
PROJECT No.		15-20610	FILE No.		1520610001	
DESIGN	ANG	01/27/17	SCALE		AS SHOWN	
CADD	BPG	01/27/17	DRAWING 1			
CHECK	ANG	01/27/17				
REVIEW	JRD	01/27/17				



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NOTES:

1. DISCHARGE FROM LOWER ASH POND MAY BE SENT TO INFLUENT STORAGE TANKS OR THE CSWTS.
2. DISCHARGE FROM UPPER ASH POND MAY BE SENT TO THE LOWER ASH POND, THE INFLUENT STORAGE TANKS, OR THE CSWTS.
3. CSWTS CONFIGURATION SHOWN FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY.

LEGEND

 PUMP



AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO ON 6/20/16.
MAP DATA BY: GOOGLE. IMAGERY DATE: 04/05/16

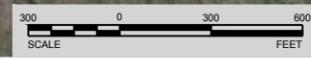
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PROJECT						
DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE						
CENTRALIZED SOURCE WATER TREATMENT SYSTEM (CSWTS) SITE PLAN						
PROJECT No.		15-20610	FILE No.		1520610002	
DESIGN	ANG	01/27/17	SCALE		AS SHOWN	
CADD	BPG	01/27/17				
CHECK	ANG	01/27/17				
REVIEW	JRD	01/27/17				
DRAWING 2						





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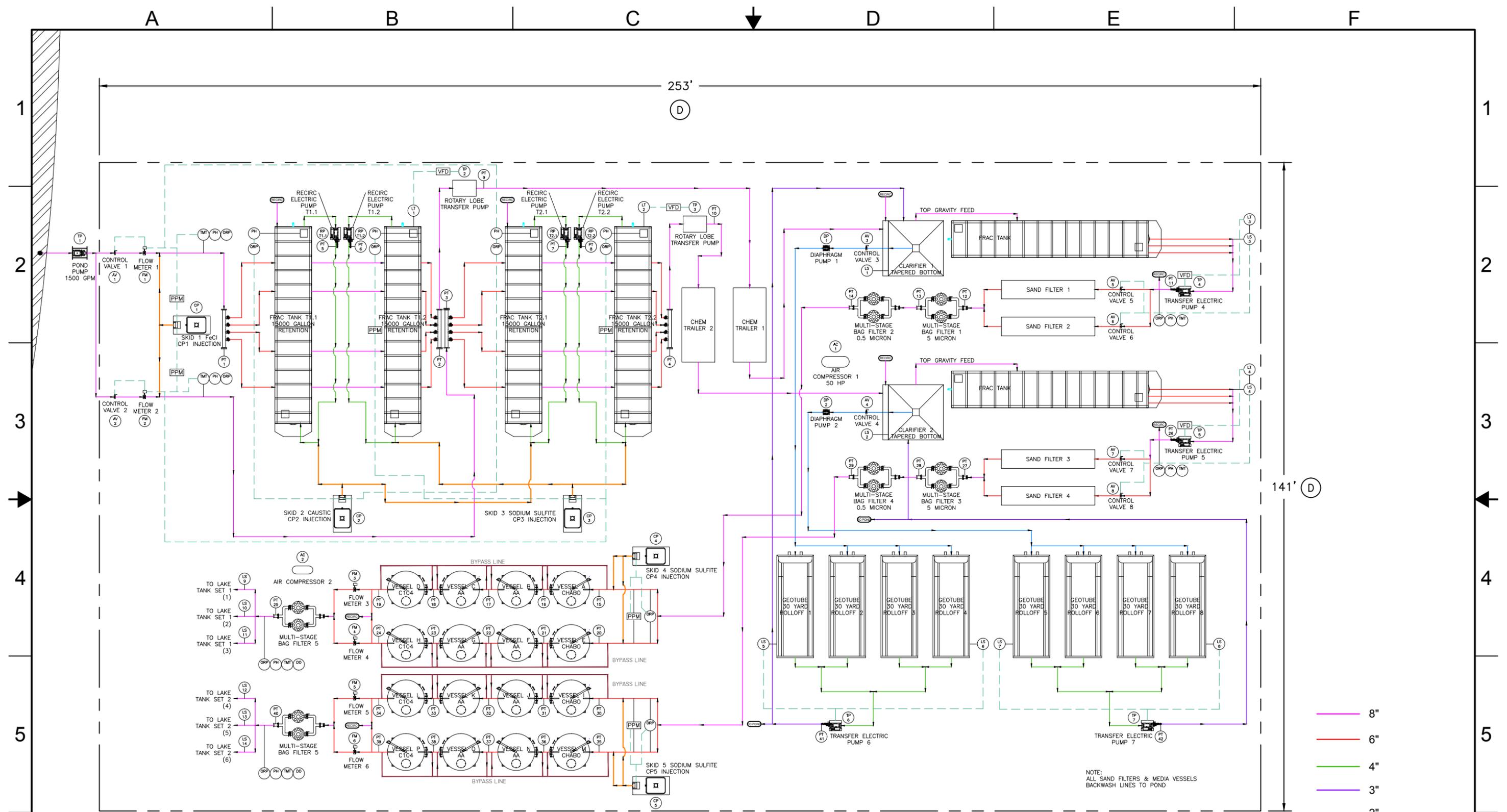
LEGEND
 ▲ **PIEZOMETER**
 ⊗ **SURFACE WATER SAMPLE**



AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO ON 6/20/16.
 MAP DATA BY: GOOGLE. IMAGERY DATE: 04/05/16

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
PROJECT						
DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE						
SOURCE WATER PIEZOMETER AND DECANT WATER SAMPLE LOCATIONS						
PROJECT No.		15-20610	FILE No.		1520610003	
DESIGN	ANG	01/27/17	SCALE		AS SHOWN	
CADD	BPG	01/27/17	DRAWING 3			
CHECK	ANG	01/27/17				
REVIEW	JRD	01/27/17				





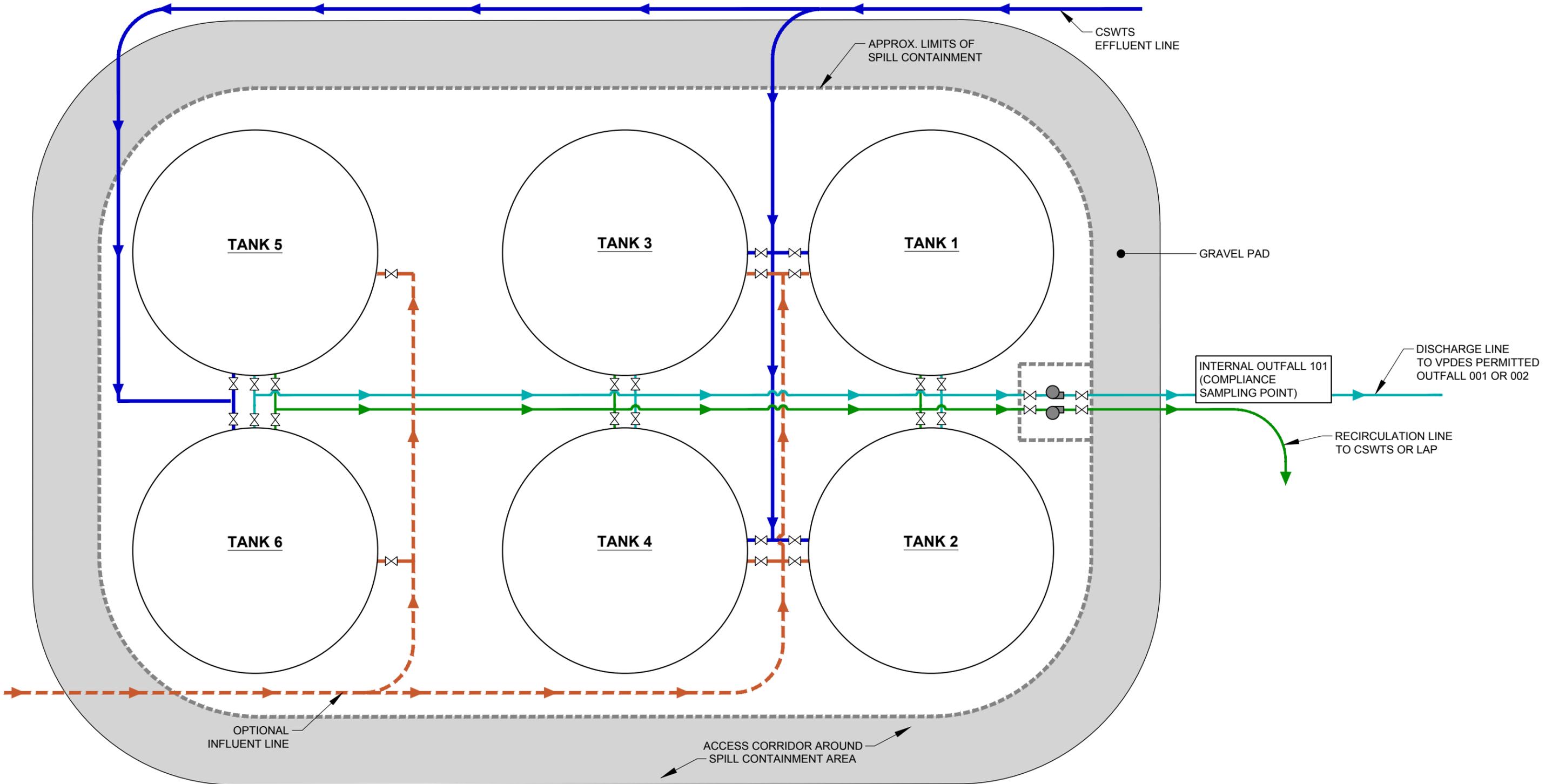
253FT X 141FT AREA FOR EQUIPMENT

NOTES:
 1. OPTIONAL MEDIA VESSELS MAY BE ADDED, AS NEEDED, IN ANY STAGE OF THE TREATMENT SYSTEM TO ENSURE COMPLIANCE WITH EFFLUENT LIMITS.

6			DRAWING NO. G-101	SIZE B	SCALE	REV D	JOB NO. 11128		ALL INFORMATION CONTAINED IN THIS DOCUMENT ARE PROPRIETARY AND THE PROPERTY OF PROACT SERVICES CORPORATION. PATENT PENDING	PROCESS FLOW DIAGRAM 1500 GPM WATER TREATMENT SYSTEM Drawing 4	6
	D	07/10/2017	CHANGE EQUIPMENT LAYOUT TO MATCH FOOTPRINT	SMT							
	C	11/14/2016	ADD PIPE SIZE CHART	SMT							
	B	11/11/2016	UPDATE CHEM INJECTION, VESSELS, ADD SHEET 2	SMT							
	A	10/21/2016	INITIAL DRAWING	SMT							
REV	DATE	DESCRIPTION	DRW								
			CUSTOMER				UNIT NO.				
			DRAWN BY STEVE TURNER			DATE 10/21/2016	SHEET 1-1				

A B C D E F

C:\Plan Production Data Files\Drawing Data Files\15-206100 - CER Drawings (Dec. 2018)\Active Drawings\1520610005.dwg | Layout: DWG 5 | Modified: SBarely 05/22/2017 4:10 PM | Plotted: SBarely 05/22/2017



NOTES

1. PIPING SHOWN FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY.
2. SPACE BETWEEN TANKS TO BE GRADED TO DRAIN IN CONTAINMENT AREA.
3. PROCESS SAMPLES MAY BE TAKEN FROM TANKS.
4. TANKS MAY BE FOR INFLUENT OR EFFLUENT.
5. THE NUMBER OF TANKS MAY BE ADJUSTED, AS NEEDED.

LEGEND

- ▶ EFFLUENT LINE
- - -▶ OPTIONAL INFLUENT LINE
- ▶ RECIRCULATION LINE
- ▶ DISCHARGE LINE TO INTERNAL OUTFALL 101 AND OUTFALL 001 OR 002
- ⊗ VALVE
- BOOSTER PUMP

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
PROJECT: DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE: CONCEPTUAL OPTIONAL INFLUENT / EFFLUENT STORAGE TANK SCHEMATIC						
PROJECT No. 15-20610		FILE No. 1520610005				
DESIGN	ANG	01/27/17	SCALE	AS SHOWN		
CADD	BPG	01/27/17	DRAWING 5			
CHECK	ANG	01/27/17				
REVIEW	JRD	01/27/17				



APPENDICES

APPENDIX A
PROACT'S TREATABILITY STUDY



Dominion Power, Chesterfield Ash Pond Treatability Study J11128

Innovative Air & Water Treatment Solutions



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Table of Contents

Executive Summary	1
1. Background	2
1.1 Introduction	2
1.2 Theory and Treatment Approach	2
1.2.1 Arsenic.....	2
1.2.2 Selenium	3
1.2.3 Chromium.....	3
1.2.4 Thallium	4
1.2.5 Total Suspended Solids	4
2. Pilot Study Details	4
2.1 Bench Scale Testing	4
2.2 Transfer and Influent Holding	6
2.3 Chemical Injection	6
2.4 Inclined Plate Clarifier.....	6
2.5 Filtration.....	7
2.6 Media and Polishing	7
2.7 Control.....	7
3. Treatment System Results	7
3.1 Arsenic Removal	8
3.2 Selenium Removal	9
3.3 Chromium Removal.....	9
3.4 Thallium Removal.....	10
3.5 Total Suspended Solids Removal	10
3.6 Toxicity Analysis.....	10
3.7 Piezometer Bench Scale Testing	10
3.8 Other Contaminants	11
4. Full Scale Design	13
4.1 Hydraulic Loading.....	13
4.2 Chemical Injection	14

4.3 Media Vessels.....	15
4.3.1 Sizing.....	15
4.3.2 Chabazite Usage.....	15
4.3.3 Cation Exchange Usage.....	15
4.3.4 Activated Alumina Usage.....	16
4.4 Automation.....	16
5. Conclusions	17
6. ProAct’s Commitment to Safety.....	17
Appendices	18
<i>Appendix A – Tables and Graph</i>	<i>A-1</i>
<i>Appendix B – VPDES Permit No: VA0004146 Discharge Limits and Monitoring Requirements.....</i>	<i>B-1</i>
<i>Appendix C – Process and Instrumentation Diagrams</i>	<i>C-1</i>
<i>Appendix D – Itemized Lists of System Components and Instrumentation</i>	<i>D-1</i>
<i>Appendix E – Sample Points.....</i>	<i>E-1</i>
<i>Appendix F – Lab Packages with Chain of Custody</i>	<i>F-1</i>
<i>Appendix G – Daily Activity Reports.....</i>	<i>G-1</i>
<i>Appendix H – SDSs for Proposed Chemicals</i>	<i>H-1</i>

Executive Summary

This report describes a pilot study to determine the most effective treatment options to remove water contaminants at the Dominion Chesterfield Integrated Ash Project (CHIAP). A multi-stage pilot system was designed for contaminant levels at the CHIAP site. It was then tested, and the results used to design a full-scale system.

The pilot system included four mixing tanks where the chemicals ferric chloride, a caustic, sodium sulfate and polymers were added. The resulting floc was removed by a clarifier, sand filter and bag filter. Sludge was addressed by Geotubes[®]. The treatment stream then ran through four vessels, each filled with a different media: chabazite, activated alumina (AA), Purolite C104Na ("C104Na) and Purolite A100 ("A100"). The water then ran through a final bag filter.

Analysis consisted of drawing samples at each step of the treatment process to track contaminant reductions as the treatment stream moved through the system. The system was also tested with differing influent qualities. A toxicity study of the effluent was also conducted, following U.S. EPA methodology.

Results indicate that most contaminants are treated sufficiently by ferric co-precipitation (FCP), paired with a clarifier. Media vessel filtration with Chabazite treated thallium. AA further reduced selenium and zinc levels. Ion exchange resin C104Na removed most secondary metals effectively. A100 reduced chromium VI.

The full scale system operates at a maximum flow rate of 1,500 gpm or 750 gpm. It consists of two 750 gpm systems running in parallel. The two systems are identical in design.

Each system has four mixing tanks where chemicals will be injected. A clarifier, sand filter and bag filters will remove the floc. Then ion exchange vessels will remove remaining metals and a final bag filter.

ProAct Services is confident that it can build and operate the full scale system to treat water to meet the discharge permit limits.

1. Background

1.1 Introduction

Dominion contracted ProAct Services to design and deploy a pilot system to treat water at the CHIAP. The purpose of the pilot system was to determine the most effective treatment options to remove contaminants. The treatment options were tailored to contaminant levels at the CHIAP site, as provided in the Request for Proposal (RFP) Table 1 and compared to levels detailed in VPDES Permit No: VA0004146 (see the table below).

Major contaminants were arsenic, selenium, chromium, thallium, and total suspended solids (TSS). Initial analysis of these target contaminants includes a discussion of treatability, various treatment approaches and the selected methods tested in the pilot study. A complete list of contaminants is in Appendix B.

Table 1.1.1 Comparison of Major Contaminants in RFP Table 1 and VPDES Permit

Contaminant	Influent Conc.(a)	Effluent Criteria (Monthly Average)	Effluent Criteria (Daily Maximum)	Unit
Metals				
Arsenic (total)	3,020	240	440	µg/L
Chromium VI (total)	15.3	17	32	µg/L
Selenium (total)	160	7.7	14	µg/L
Thallium (total)	1.3	0.9	0.9	µg/L
Others				
TSS	332	30	100	mg/L

1.2 Theory and Treatment Approach

To most effectively remove contaminants from the source water, it is important to understand the impacts of each treatment step and its effectiveness in the context of the system as a whole.

1.2.1 Arsenic

The most common forms of arsenic in power plant ash are arsenite (As³⁺) and arsenate (As⁵⁺). The table below summarizes the major characteristics of each.

Table 1.2.1 Major Characteristics of Arsenite and Arsenate

	Arsenite	Arsenate
Charge	Positive three	Positive five
Effect of ORP	Present at lower ORP	Present at higher ORP
Effect of pH	Non-ionic at neutral pH	Ionic at pH above 2.8
Solubility	Highly soluble	Less soluble than arsenite
Treatment Characteristics	More difficult to remove than arsenate	Strongly adsorbed

To more effectively treat arsenate, many processes include controlled aeration to oxidize As^{3+} into As^{5+} . This pilot did not use this approach, because the contact between ash ponds and ambient air slowly oxidizes arsenic. Also, additional aeration may convert selenium into a less treatable form, introducing new compliance difficulties, as the limit for selenium is much more stringent than that of arsenic.

Effective arsenate treatment methods include FCP and AA adsorption. FCP is one of the most effective methods for removing arsenic from water, especially when compared to other commonly used chemicals such as alum. At Dominion's Possum Point power station, ferric chloride successfully removed arsenic from water without pre-oxidation.

1.2.2 Selenium

While selenium can exist in different compounds and oxidation states, the most commonly found are selenate (Se^{6+}) and selenite (Se^{4+}). As determined from ProAct's extensive treatment experience, both species are commonly found in coal ash pond water. AA has consistently proven to be successful in removing selenite. AA removes selenate to a much lower degree and efficiency. However, as discharge limits for selenium are low, steps need to be put into place specifically to remove selenate.

The FCP and filtration used to remove arsenic also helps reduce and remove selenate. Sodium sulfite (Na_2SO_3) may be used as an additional reducing agent to help convert selenate to selenite. This reduction can also reduce arsenic into a form more difficult to remove, a potential drawback of including Na_2SO_3 reducing agent in a treatment system. A possible additional or alternative treatment step uses a weakly basic anion media, which, upon testing, proved the ability to remove selenate, as detailed in the treatment system results discussed below.

1.2.3 Chromium

Chromium VI ($Cr(VI)$) is consistently removed by weakly basic anion exchange resins. Given the source water chromium VI concentrations, this approach should remove chromium VI below discharge limits.

1.2.4 Thallium

Ferric chloride does not remove thallium when paired with filtration in the system. Because of this, a cationic exchange resin step is used to remove thallium from the source water. The selected resin removes thallium without significantly changing pH. The preferred resin is the weakly acidic chabazite. A stronger ion exchange resin favors calcium and magnesium removal. Calcium and magnesium concentrations are significantly higher than those of the targeted contaminants. This higher selectivity would cause a shorter media breakthrough period, making operations more complex.

1.2.5 Total Suspended Solids

Effective suspended and submicron colloidal solids removal is crucial to the treatment system. The pilot study tested filtration, flocculation and coagulation methods to determine the best combination and dosing rates to balance metal and downstream TSS removal. Filtration methods used included clarification, sand filtration and graduated bag filtration. In preliminary bench-scale tests almost 90% of suspended solids passed through a 1.5 µm filter. Coagulant and flocculent filtration aids and half micron and high efficiency bag filter socks are needed to remove these sub-micron particles.

2. Pilot Study Details

Treatment started with transferring and holding pond water, then chemical injection and clarification, followed by filtration and sludge removal, and finally media and high efficiency polishing. The basic pilot system process and instrumentation diagram (P&ID) in Appendix C outlines the entire treatment system. Following sheets show each section. The Daily Activity Reports (DARs) in Appendix G describe actions taken each day.

2.1 Bench Scale Testing

Bench scale tests helped establish the best operating conditions for full scale operation.

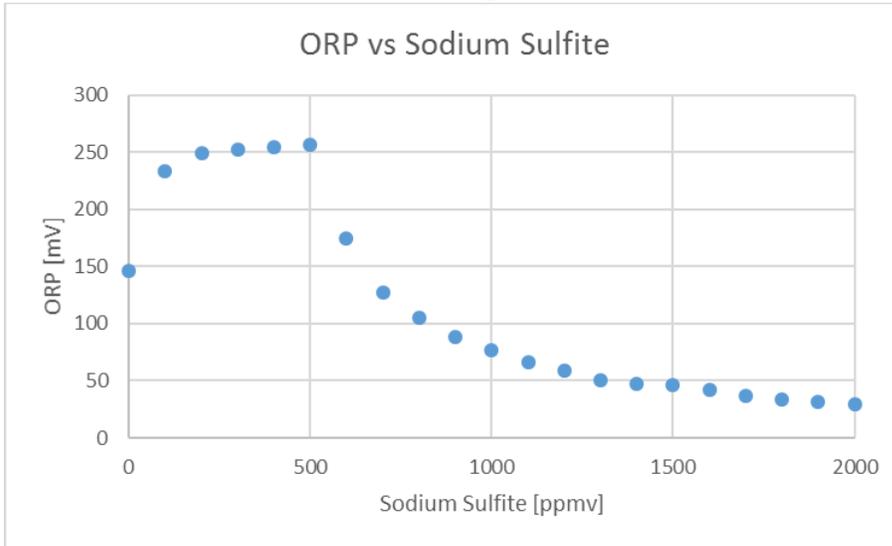
The first set of tests were to determine how chemical addition affected the oxygen reduction potential (ORP). The table below describes the test that were run.

Table 2.1.1 Bench Testing Dosage Regimen

Dosing Regime	Sodium sulfite	Ferric chloride	Caustic
A	0 – 2,000 ppmv		
B	0 – 2,000 ppmv	100 ppmv	
C	0 – 2,000 ppmv	150 ppmv	
D	0 – 2,000 ppmv	150 ppmv	to pH 6.5 s.u.

Dosing Regime A, dosing with only the reducing agent sodium sulfite, was to gain a base line. This test showed that at low doses the reducing agent raised the ORP levels, and higher doses reduced ORP levels. The table below shows the general trend of ORP with increasing sodium sulfite doses.

Table 2.1.2 ORP Levels with Increasing Sodium Sulfite



Dosing Regimens B and C tested the effect of increasing sodium sulfite, with the addition of 100 ppmv and 150 ppmv of ferric chloride, respectively. Dosing Regime C measured the effect of increasing sodium sulfite along with 150 ppmv ferric chloride and caustic to reach a pH of 6.5. In each case the same trend was present and a reduction in ORP did not occur until 500 ppmv of sodium sulfite was added.

The next set of bench scale tests consisted of a matrix, of 27 runs with varying doses of ferric chloride (50, 100, 150 ppmv) caustic (0, 75, 150 ppmv) and sodium sulfite (450, 900, 1300 ppmv). These tests allowed each variable to be analyzed individually, and as a group. The water resulting from each dosing regime was then tested for selenium and arsenic concentrations.

Across all tests, higher ferric chloride dosing gave higher selenium and arsenic removal. The 50 ppmv increase in ferric chloride from 50 ppmv to 100 ppmv caused a higher selenium and arsenic reduction than the 50 ppmv increase from 100 ppmv to 150 ppmv.

These tests also showed that adding caustic negatively impacted selenium and arsenic removal. This effect became less pronounced as ferric chloride dose increased. From this it was inferred that adjusting pH by adding caustic should have very little effect on selenium and arsenic removal.

The addition of sodium sulfite had much lower effect on reduction. From 450 ppmv to 900 ppmv a slight improvement of removal was seen, however from 900 ppmv to 1,300 ppmv, contaminant values increased.

These results allowed ProAct to determine the settings for the full scale pilot test. Through these tests, ProAct decided to start the full scale operation at 80 ppmv of ferric chloride, 25 ppmv of caustic, and 670 ppmv of sodium sulfite. This was believed to offer the best chemical dosing for efficient removal.

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2.2 Transfer and Influent Holding

A submersible pump in the ash pond transferred water into the system. The pump was attached to a flotation device to suspend it 5 ft. below the surface. The pump depth was changed to draw influent from surface water near the mouth of the Lazy River. Last, the pump was lowered to approximately 6 in. above the ash bottom at the same location.

At each depth and location lab samples were analyzed to predict influent concentrations of each contaminant as a reference for deploying a full-scale system. Influent concentrations were also used to analyze the pilot system response to the different levels. Pond samples were also taken at a 10 ft. depth to monitor possible contaminant concentration changes. The pond pump was used to maintain the level in the influent holding tank, from which water was pumped into the initial chemical injection skid.

2.3 Chemical Injection

The chemical injection skid used to treat water has four separate treatment chambers connected via a gravity feed system. Each chamber has a recirculation pump and mechanical mixer. Water feed rates into the system ranged from 25 to 56 gpm, allowing for a minimum 18 min. retention time per chamber. Each chamber had a different chemical injection blend, including 40% ferric chloride, 25% caustic, 10% sodium sulfite, coagulant, and flocculant.

Each injection point was followed by a static mixer. The static mixers and mechanical mixers ensured water quality consistency throughout the process. Monitoring instruments on chambers included pH and ORP probes as well as sampling points for handheld comparisons of pH, ORP and turbidity. Injection pumps were appropriately sized and compatible for each chemical being injected, and could be set to automatically adjust flows in order to maintain a consistent pH, ORP, or ppmv.

2.4 Inclined Plate Clarifier

Water in the mixing tank overflows to a fifth chamber for clarification. The chamber passes water up a parallel network of inclined plates that dramatically increase the surface area beneath the flow to 400 ft² to decrease the loading rate. Plates are inclined towards the inlet chamber at a 55° pitch so precipitated material sloughs back into the collection chamber. Floc accumulates in the conical hopper bottom, from which a double-diaphragm pneumatic pump draws sludge through the 2 in. waste pipe connected to the hopper discharge. Sludge is directed to a sludge thickening tank or a filter lined dewatering box. Clarified water is transferred to a conical holding tank, from which transfer pumps move water into the filtration treatment process. An optional clarifier bypass allowed comparing Geotube® effectiveness to clarifier effectiveness.

2.5 Filtration

A 2-36 sand filter with automatic backwashing was used with the two pods running in parallel. Each 36 in. pod held 400 lb. gravel and 800 lb. silica sand. The water leaving the sand filters entered the first bag filter assembly. The first assembly consisted of three parallel housings with 5 µm socks, followed by three parallel housings with 0.5 µm socks. After the media vessels described below, there was another bag filter assembly, which consisted of four parallel housings with 0.5 µm socks.

2.6 Media and Polishing

Four media vessels were plumbed in series to remove dissolved and colloidal suspended metals. Each vessel is approximately 84 in. tall with a 36 in. diameter. Permissible operating pressure was 75 psig, and each vessel had an inlet, outlet, drain, bleed valve and top manway. Each set includes interconnecting 2 in. pipe, 3 in. butterfly valve, 3 in. gate valve, pressure gauges, and sampling ports.

The media amounts were calculated to last the duration of the project. No media change out was needed. Supplied media included:

- 2,000 lb. of granular AA
- 2,000 lb. of chabazite zeolite
- 2,300 lb. of C104Na (sodium form)
- 1,200 lb. of A100 (chloride form)

2.7 Control

An Allen Bradley control panel with programmable logic controller (PLC), human machine interface (HMI) screen and web-based telemetry controlled all system functions for the chemical injection skid. This control included the injection rate for all chemicals and a high-high pump shut off to prevent overflow of the gravity feed system. The panel has all necessary motor overload protectors, motor starters and variable frequency drives (VFDs). Floats in the holding tank were used to cycle Transfer Pump 2 and 3 (TP2 and TP3, respectively) between a high and low operating level. There was also a high-high shut off in the discharge frac tank. The entire unit was connected to a power supply disconnect box, powered from an onsite generator.

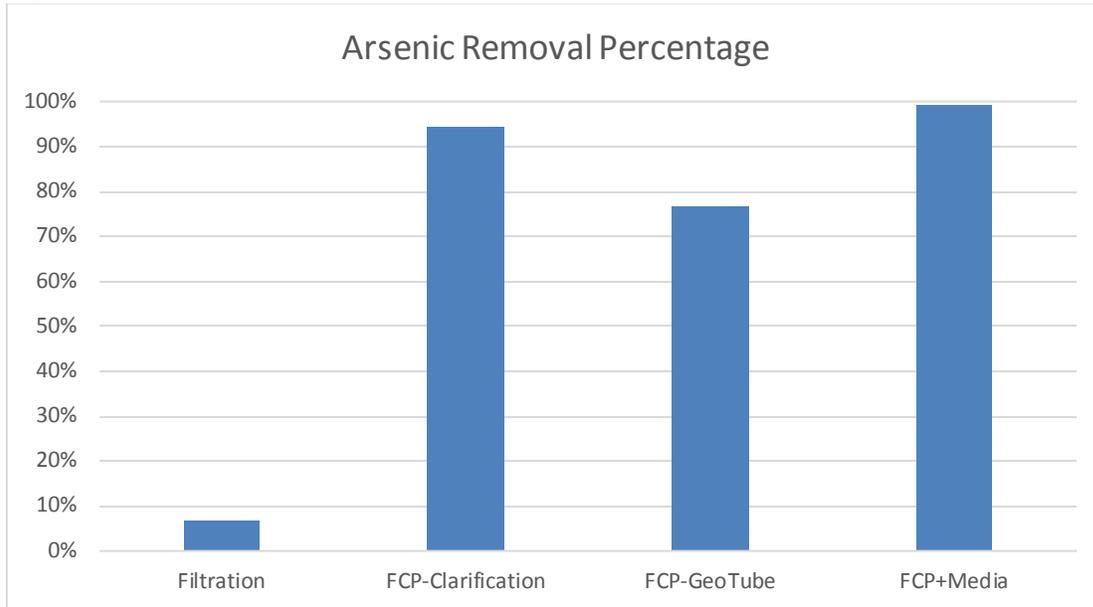
3. Treatment System Results

The influent stream was varied and tested for all target contaminants to analyze potential influent levels. For each influent location, multiple scenarios were used to analyze the efficacy of different treatment options and resulting effluent concentrations. Depending on the test, samples were analyzed after one or more of the following treatment steps: clarifier, 0.5 µm bag filters, and media vessels. Sample analysis was also done at each media vessel to analyze the effects of each subsequent vessel on the levels of each major contaminant identified in section 1.

3.1 Arsenic Removal

Influent arsenic levels averaged 66.8 ppb over the course of the study. The highest concentrations were 99.8 and 89.1 ppb at the main pond surface. Dropping the suction 5 ft. lowered influent arsenic concentrations to 73.2 and 49.7 over two days. Concentrations at the mouth of the Lazy River were similar. While these levels were lower than the discharge limit of 240 ppb, arsenic is a known problem with ash ponds and emphasis was placed on reducing this level as much as possible. Each treatment option's efficacy was gauged based on its ability to remove arsenic, as summarized in Figure 3.1.1.

Figure 3.1.1. Comparison of Removal Efficacies for Different Arsenic Treatment Options



When only using filtration steps in the system, 6% of total arsenic was removed, indicating that most of the arsenic is either colloidal or dissolved. When FCP was added in conjunction with filtration, effluent arsenic was reduced to 3.7 ppb. Combining the precipitation with flocculation, coagulation and clarification removed 94.5% of arsenic. This 3.7 ppb effluent concentration was compared to levels achieved by running through a Geotube®, which was only able to achieve 76.6% removal; giving an effluent concentration of 15.6 ppb. Secondary filtration through sand pods, 5 µm bag filters and 0.5 µm bag filters led to an average 1.2 ppb arsenic level, a total reduction of 98.2%.

Varying ferric chloride and sodium sulfite gave no notable reduction level change. Dosing levels for each ranged from 50 to 150 ppmv and 0 to 1000 ppmv respectively, showing that increasing either chemical beyond the lowest dose would not benefit the system, for this particular contaminate, at these influent conditions. Adding media vessels to the system further reduced the concentration to 0.47 ppb, a total reduction of 99%. A table showing the daily treatment for each section is in Appendix A.

3.2 Selenium Removal

Selenium is a particular contaminant of note, as its phases are notoriously difficult to remove; many operations fail to achieve levels below 5 ppb. Influent concentration during ProAct's pilot study averaged 33.3 ppb. The highest influent concentration, 45.2 ppb, was found at the main pond surface, and the lowest influent concentration, 27.9 ppb, at the Lazy River surface. Since these values varied widely in each location, the data did not reflect a correlation of location and concentration. With clarification and filtration only, an 8% removal was seen, showing that most selenium is either colloidal or dissolved.

An initial test using FCP resulted in a final concentration of 7.75 ppb. Adding flocculation and coagulation gave an average post-clarifier level of 5.4 ppb. Further optimization of dosing levels gave an average of 4.57 ppb. Using a Geotube® in place of the clarifier did not give comparable pre-sand filtration levels, as the selenium concentrations averaged 10.8 ppb post-Geotube®. Secondary filtration through the sand pod and bag filter housings further reduced effluent levels 87.4% to an average of 4.2 ppb.

During most of the pilot ferric chloride was injected at 80 ppmv. Lower dosage did not drop pre-media reduction, indicating that lower dosage could be used during full scale treatment. Tests were also performed at varying dosages of sodium sulfite, which reduces selenate to selenite. The injection was varied from 0 ppmv to 1,000 ppmv and no notable change in reduction was seen. This suggests that most of the selenium is in the selenite phase, full scale treatment will only need injection if a decrease in FCP reduction is observed. Levels of added caustic were also varied, to control pH and optimize adsorption, as AA has been shown to most effectively remove selenium and other contaminants at pH levels near 6.5.

Adding media vessels in series reduced the final effluent concentration to 2.7 ppb, a 91.9% total reduction. Much of the removal occurred in the AA vessel, where levels were reduced by nearly half. A100 was also able to remove some contaminants, providing a semi-effective polishing media for the end of the treatment chain.

Each media was then used in lead to determine the single media efficiency. AA had the greatest removal from 4 ppb to 2 ppb, while A100 only removed from 4 ppb to 3.5 ppb. This is consistent with the belief that most selenium exists as selenite, as A100 is used to remove selenate. There was no selenium reduction across the chabazite or C104Na individually. A table showing the daily treatment for each section is in Appendix A.

3.3 Chromium Removal

Initial influent chromium levels were well below discharge limits, with an average level of 4 ppb. The pilot system reduced this contaminant to below 0.5 ppb. FCP paired with filtration reduced the pre-media concentration to 1.5 ppb. AA and A100 both reduced chromium levels to 0.45 ppb individually. No reduction was seen across chabazite or C104Na.

3.4 Thallium Removal

Thallium has the lowest discharge limit of any contaminant in the permit at 0.9 ppb. The average influent concentration of this contaminant was 1.1 ppb. The highest level, 1.23 ppb, was at the mouth of the Lazy River. The lowest concentration, 0.96ppb, was found at both the main pond surface and off the bottom of the Lazy River. There was no trend between different locations within the pond. Filtration only showed a 7% reduction, which again indicates the remainder to be either colloidal or dissolved.

When FCP was introduced to the system, no noticeable reduction was seen. The same is true for everything in the front end of the treatment train. An average 19% reduction was seen prior to the media vessels, though this corresponds to only a 0.2 ppb drop.

Media vessels accomplished much of the thallium level reduction, and when in series levels averaged 0.11 ppb, or an 89.6% reduction. When isolated, chabazite had the best reduction from 0.982 ppb to 0.11 ppb, followed by C104Na, which removed the contaminant to 0.186 ppb. AA accomplished some polishing as well, lowering levels to 0.233 ppb. The anionic exchange resin, A100, had no effect on thallium removal. A table showing the daily treatment for each section is in appendix A.

3.5 Total Suspended Solids Removal

While influent TSS levels were mostly below discharge limits, the pond pump was lowered to the pond floor to model upset conditions with very high solids. A combination of polymeric BHR-P50 and LBP-2101 was used with a clarifier during the standard process to help with the FCP. Reduction percentage using the combination of polymer and clarification had a 97% reduction to 3.5 NTU, with a final effluent level lower than 0.5 NTU. The increase in solids by dropping the pump depth required a redosing of these polymers, which was a very effective method of removal. The highest influent solids level was over 700 NTU, and post clarifier was reduced to 12.1 NTU, with a final effluent level of 0.3 NTU.

3.6 Toxicity Analysis

An effluent sample was tested according to the Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, October 2002, (EPA-821-R-02-012). Species of both Ceriodaphnia dubia and Pimephales promelas were analyzed over 24 hr. and survival rates were recorded to determine the treatment system effluent toxicity. Both species had a 100% survival rate, a passing result. Further information on this process is in appendix F.

3.7 Piezometer Bench Scale Testing

A water sample was collected from one site monitoring well and sent to the lab for analysis. The table below shows the results from the raw sample, after filtering result and with ferric chloride and sodium sulfite addition.

Table 3.7.1 Piezometer Bench Scale Testing Results

	Raw Well	Filtered Well	Run 1	Run 2	Run 3
	Ferric Chloride (ppmv)		50.00	100.00	150.00
	Sodium Sulfite (ppmv)		900.00	900.00	900.00
Arsenic (ppb)	1,700.00	772.00	687.00	492.00	167.00
Diss	27.30	627.00	275.00	91.90	67.40
Iron (ppb)	43,000.00	1,630.00	3,300.00	1,920.00	600.00
Diss	17.10	60.00	60.00	91.40	60.00
Selenium (ppb)	9.10	4.55	9.10	4.55	4.55
Diss	0.91	4.55	4.55	4.55	4.55

The well samples had a much higher solids level than the surface water used during the pilot tests. Arsenic and iron levels were much higher, though the level for selenium was lower. During the pilot test, simulated high solids water was successfully treated, and thus is not a concern. At the bench scale, chemical treatment and filtration removed up to 90% of arsenic and selenium to below 5 ppb. The water in the piezometers should be easily treated by the same means as the surface water.

3.8 Other Contaminants

While target contaminants of the highest concern were treated as detailed above, various treatment steps can address additional contaminants listed in the discharge permit. A summary of these contaminants, along with the effluent criteria and treatment steps that address each contaminant are in the table below.

Table 3.8.1. Treatment Steps and Discharge Limits for Contaminants

Contaminant	Treatment Step	Average Influent Conc. [µg/L]	Average Discharge Conc. [µg/L]	Effluent Criteria (Monthly Average) [µg/L]
Metals				
Arsenic(total)	FCP, AA	66.8	0.6	240
Cadmium	C104	0.3	0.1	1.4
Chromium (total)	A100	3.8	0.5	100
Copper(total)	C104	4.6	0.6	11
Lead (total)	C104	1.9	0.2	17
Mercury (total)	C104	0.2	0.2	1.2
Nickel (total)	AA, Chabazite, C104	10.6	1.6	26
Selenium (total)	FCP, AA, A100	33.3	2.7	7.7
Silver (total)	C104	0.1	0.1	2.7
Thallium (total)	Chabazite	1.1	0.1	0.9
Zinc(total)	AA, C104, A100	11.6	3.6	100
Others				
Ammonia Nitrogen	Chabazite	0.4	0.1	0.382
pH	pH Adjustment	7.6	8.7	6 - 9
TSS	Clarification, Filtration	45.4	2.5	30 [mg/l]
Chloride		238	302	360 [mg/l]
Oil and Grease	Filtration	6.7	4.3	15 [mg/l]

As seen above, each contaminant that may increase as water quality changes throughout the system can be addressed through the media vessels, FCP, and other measures implemented in ProAct's bench scale and pilot testing, with the exception of chloride. Chloride requires close monitoring, and if it nears the discharge limit, a carbon vessel could be added.

The potential of each contaminant to become an issue in the system was taken into account when scaling up the pilot operations into a full-scale treatment system capable of discharging permit-compliant effluent water. The most worrisome contaminant to note is ammonia, as a very small increase in concentration has a very large negative impact on chabazite lifespan. Ammonia, too, will be closely monitored, in case estimates of chabazite use need to be updated, or the chabazite vessels need to be re-sized.

4. Full Scale Design

The full scale system is designed with an option to operate at a maximum flow rate of 1,500 gpm or 750 gpm. For best predictability the full-scale design should mirror the pilot study as closely as possible. The pilot study used four mixing tanks with a 20 min. retention time at 50 gpm. To provide the same retention time at 1,500 gpm would require each tank to be 30,000 gal. Since the largest tank easily mobilized is a 20,000 gal. frac tank, the flow will be split into two parallel 750 gpm systems each with a frac tank. Each system will be isolated, allowing easy scalability of flow. The parallel systems also lower the risk that failure of any single part could affect the entire system.

A P&ID showing the two 750 gpm systems working together to give a 1,500 gpm treatment flow is in appendix C. An itemized list of system components and instrumentation is in appendix D. This design is a draft and may be changed and modified in further iterations.

Unless otherwise noted, the remainder of section 4 relates to one 750 gpm system. The final design will consist of two such systems running parallel to achieve the total 1,500 gpm flow requirement.

4.1 Hydraulic Loading

The two systems together have four possible flow rates: 1,500 gpm (for two 750 gpm systems running in parallel), 750 gpm, 375 gpm, and 250 gpm. Ideal water velocity through a pipe, for the most cost effective balance between pipe size and pump size, is between 5 and 8 ft./sec. A target water velocity of 5 ft./sec. to 6 ft./sec. and schedule 80 PVC pipe dimensions were used to determine pipe size, as shown in the table below.

Table 4.1.1. Flow Rate, Pipe Size, and Fluid Velocity through Treatment System

Flow [gpm]	Size [Inch]	Velocity [ft./s]
1500	10	6.7
750	8	5.27
375	5	6.61
250	4	6.97

The pipe for the gravity feed between the mixing tanks and into the clarifier cannot be sized using the above approach. Using the Hazen-Williams equation and assuming a 1 in. drop over 10 ft. between each tank, one 8 in. pipe is needed for a 750 gpm flow. To be conservative and prevent overflow in the event of a lower drop or even a rise between tanks, three 8 in. pipes are recommended between each tank.

The clarification unit used for sediment removal will be sized by the vendor to handle the specified flow rate and conditions. The sludge collected in the bottom of the clarification unit will be pumped into two dewatering boxes, each holding a Geotube®, to facilitate sludge dewatering and material handling. Each clarifier will have two dewatering boxes in parallel, so when one dewatering box is being serviced, treatment can continue through the other dewatering box.

The treatment stream will gravity feed from the top of the clarification unit into a filter box that also acts as a transfer vessel. A 40 yd³ filter box holds 8,000 gal., and provides a 10 min. retention time at 750 gpm and a hydraulic loading of 4 gpm/ft². A second filter box will run parallel for switch over purposes.

Water is pumped from the filter box into automatically backwashing sand filters. Sand filters are most effective when the hydraulic loading for each filter is between 5 and 10 gpm/ft². Two 4-54 sand filters in parallel provide 5.87 gpm/ft² loading.

The treatment stream from the sand filters enters a set of bag filters, either with 5 µm nominal or ½ µm nominal bags. Since each filter ideally handles 50 gpm, 15 bags in parallel are needed to carry 750 gpm. Using two sets of duplex bag filter pods in series, with 8 filter housings per set gives a total filter count of 16 bags for a loading of 46.9 gpm per bag. The same setup can be used after the media vessels to house the high efficiency polishing bag filters.

4.2 Chemical Injection

Mirroring the pilot system, there are four mixing tanks in series, each with individual chemical injection provided by a skid-mounted metering chemical pump. Mixing may be provided by either mechanical mixers or recirculation pumps. The table below shows the chemicals and injection rates for each tank.

Table 4.2.1. Mixing Tank Chemicals and Injection Rates

Tank	Chemical	Location	Injection Rate
1	Ferric chloride	Inlet	20 ppmv to 150 ppmv, or 7 gph
1	Caustic (to bring pH back to 6.5)	Recirculation line	2 gph
2	Sodium sulfite	Recirculation line	Up to 1000 ppmv, or 50 gph
3	Polymer	Recirculation line	500 ppmv, or 25 gph injection for each
4	Polymer	Recirculation line	500 ppmv, or 25 gph injection for each

Due to the high injection rate in the second tank, using two pumps is recommended to maintain scalability along the full 0-1000 ppmv range. The third and fourth tank polymers are for the purpose of coagulation and flocculation. Also two sulfite skids upstream of the media vessels will be available if needed, sized for 25 gph each. Individual pump skids will only be used as needed, since there may be circumstances where one or more chemical is not needed to reach the discharge limits.

4.3 Media Vessels

4.3.1 Sizing

Media vessel hydraulic loading below 10 gpm/ft² gives optimal functioning. At 750 gpm, a cross sectional area of at least 75 ft² is needed. For ease of transport and integration into the current system, it is recommended to use two 8 ft. diameter vessels in parallel, each with a bed area of 50 ft². This set up accommodates a 7.5 gpm/ft² loading.

4.3.2 Chabazite Usage

The first media is chabazite, with a bulk density of 40 lb./ft³ and a loading rate of 0.2 meq/g media for lead and thallium. This requires 300 ft³ and 12,000 lb. of chabazite for each 8 ft. diameter vessel. When calculated against lead and thallium, this much media in two parallel vessels is expected to last the entire 18 mo. project.

The ammonia loading rate is much lower at 0.3mg/g. During the pilot test ammonia levels averaged 0.265 ppm while pumping from the main pond. As the maximum discharge level is 0.382 ppm, with thallium and lead both having greater ion selectivity, ammonia should not be a concern. If ammonia levels increase, additional treatment may be needed.

4.3.3 Cation Exchange Usage

The second media is a weakly acidic cation exchange media, C104Na, which removes mercury, copper, lead, nickel, zinc, cadmium and thallium. In the influent, each of these metals is below the discharge limit, except for thallium. The combined average level in the influent is 30.3 µg/l, which is 0.9 µeq/L. Two 8 ft. diameter vessels in parallel containing 300 ft³ each, should last the entire 18 mo. project. However, due to ion selectivity, certain contaminants may break through early, requiring early media replacement.

4.3.4 Activated Alumina Usage

The third media is AA. This media is the main secondary treatment for reducing arsenic and selenium, and acts as sub-media for zinc, thallium and nickel. Because of this, vessels used in series will most efficiently use the media and prevent breakthrough which could affect downstream treatment. With 300 ft³ and 12,000 lb. of AA, two 8 ft. diameter vessels in parallel are estimated to last at least 40 days, with contaminant levels similar to those of the pilot with no ferric chloride injection. When the pre-media levels are reduced through FCP, two 8 ft. diameter vessels in parallel are estimated to last for 200 days. Using two sets of two 8 ft. vessels, with the sets in parallel and the vessels in each set in series, the lead and lag vessels should be switched when breakthrough at the lead vessels is observed.

4.4 Automation

ProAct will use automation to make the overall system operation easier and safer. It reduces possible human error and decreases the reaction time to any system disturbance. Each chemical injection skid will be automated for correct dosing. The injection skids for ferric chloride, sodium sulfite, LBP and P-50 will be tied into the influent flow meter allowing for a ppmv injection based on the flow rate. Sodium sulfite injection will either be tied to an ORP sensor in tank 2, similar to how the caustic skid will be tied to a pH sensor in tank 1, or by concentration (ppm), based on flow.

ProAct will also automate flow and level control. The influent flow meter will control the inlet flow as well as chemical dosing. For best automation, the pond pump will need ramping capabilities tied to pressure.

ProAct will automate the dewatering boxes, housing the Geotubes[®] to maintain a set level. One of two approaches will be used. The first uses level sensors to control automated valves at the dewatering box outlet, with the pump on/off operation tied into the same level sensors. The second, if continuous operation is desired, will require a VFD tied into the level sensor instead of a switch. A similar system will be used for the filter box discharge.

One suction and two discharges will require more flow meters. The level sensor and two flow meters will be tied into two flow control valves, while a VFD running off a pressure sensor will control the pump discharge pressure. The entire system back pressure will be similarly controlled with a pressure sensor and flow control valve.

Multiple automated safety controls will be included. Depending on the filter box placement a high-high float may be needed to trigger closure of a control valve coming from the clarifier; as this isn't controlling flow, a butterfly valve could be used. There will also be a high-high float in tank 1 of the gravity feed system, to trigger influent valve closure or influent pump shutdown.

5. Conclusions

ProAct's pilot study at the Dominion Power Plant in Chesterfield Virginia found arsenic, selenium and zinc to be contaminants of concern. Throughout the pilot it was determined that FCP could significantly reduce concentrations of most contaminants, thallium being a notable exception. Precipitation paired best with the clarifier rather than the Geotube®.

Thallium was reduced very little in first stage of treatment. Chabazite was the most efficient means of removing thallium. AA removed much of the remaining selenium and zinc. C104Na removed most secondary metals effectively, though influent levels were below the discharge limit. A100 reduced chromium VI, though influent concentrations were below discharge limits.

ProAct is confident that the full scale system described in this report can effectively treat influent conditions to meet the discharge permit limits. This is backed by the data collected during the pilot study. The system will be designed to be as intrinsically safe as possible, to reflect ProAct's commitment to safety.

6. ProAct's Commitment to Safety

Worker safety is the number one priority of all activities conducted by ProAct Services, and is named first among our company's five core values (Safety, Quality, Teamwork, Professionalism and Positive Attitude). ProAct Services' managers, supervisors and staff are all responsible for ensuring all work is carried out safely, based on our ongoing safety program and communications. Each employee is responsible for working safely at all times and for looking out for the safety of their co-workers. Every employee is empowered to stop work if an unsafe condition is observed.

ProAct Services' safety objective is to have zero injuries and vehicle accidents. ProAct Services is committed to preventing accidents and property loss through its formal safety program, daily safety meetings and annual ongoing safety training. Safety will continue to be a design consideration for every project performed by ProAct Services.

Appendices

Appendix A – Tables and Graphs

Table 1: Selenium Concentration Through System

Table 2: Arsenic Concentration Through System

Table 3: Zinc Concentration Through System

Table 4: Thallium Concentration Through System

Appendix B – VPDES Permit No: VA0004146 Discharge Limits and Monitoring Requirements

Appendix C – Process and Instrumentation Diagrams

Appendix D – Itemized List of System Components and Instrumentation

Appendix E – SDSs for Proposed Chemicals

Appendix F – Lab Packages with Chain of Custody

Appendix G – Daily Logs

Appendix A – Tables and Graph

Table A-1. Selenium Concentration Through System	A-2
Table A-2. Arsenic Concentration Through System.....	A-3
Table A-3. Zinc Concentration Through System	A-4
Table A-4. Thallium Concentration Through System	A-5

Table A-1. Selenium Concentration Through System

Selenium																
Date	Source	Influent	Clair	Geo	Post Sand	Post Bag	Post 1A	Post 1B	Post 1C	Post 1D	EFF	Ferric PPMv	Caustic PPMv	Sulfite PPMv	Polymer	Media
16-Sep	Main Surface	34.9				32.3					32.1	Filtration Only				
19-Sep	Main Surface										7.75	83	19	667	No	No
20-Sep	Main Surface	45.2			4.45	5.08	1.05				4.93	83	25	667	Yes	Yes
21-Sep	Main Surface										2.51	82	28	209	Yes	Yes
22-Sep	Main Surface										2.19	157	0	1000	Yes	Yes
23-Sep	Main Surface					3.58					2.01	53	0	453	Yes	Yes
28-Sep	Main 5'	35.5	4.43					1.9			1.54	82	25	657	Yes	Yes
29-Sep	Main 5'*	28.1	6.82	11		3.96	2.15	4.14	4.25	3.51		84	25	671	Yes	Yes
3-Oct	Lzy Rvr Surface	33.1	4.33	10.6				3.35			2.21	83	25	667	Yes	Yes
4-Oct	Lzy Rvr Surface	27.9	4.94								2.54	83	25	0	Yes	Yes
4-Oct	Lzy Rvr Bottom	28.3	6.5								3.27	83	25	667	Yes	Yes
5-Oct	Lzy Rvr Bottom*					18.3	3.81	16.5	37.7	40.3		0	0	0	No	Yes
Average		33.3	5.4	10.8	4.5	4.2	1.6	3.1	4.3	3.5	2.7	Average Values for Full Treatment Only				
Limit	7.7 ppb			*Medias in Lead								5-Oct Value changes due to Retention				

Highlighted squares indicate concentrations that exceed the discharge limit.

Table A-2. Arsenic Concentration Through System

Arsenic																
Date	Source	Influent	Clair	Geo	Post Sand	Post Bag	Post 1A	Post 1B	Post 1C	Post 1D	EFF	Ferric PPMv	Caustic PPMv	Sulfite PPMv	Polymer	Media
16-Sep	Main Surface	99.8				88.5					93.1	Filtration Only				
19-Sep	Main Surface										3.42	83	19	667	No	No
20-Sep	Main Surface	89.1			2	2.12	0.47				1.19	83	25	667	Yes	Yes
21-Sep	Main Surface										0.64	82	28	209	Yes	Yes
22-Sep	Main Surface										0.47	157	0	1000	Yes	Yes
23-Sep	Main Surface					0.56					0.59	53	0	453	Yes	Yes
28-Sep	Main 5'	73.2	4.93					0.47			0.51	82	25	657	Yes	Yes
29-Sep	Main 5'*	49.7	5.82	17.4		1.06	0.47	0.47	0.47	0.47		84	25	671	Yes	Yes
3-Oct	Lzy Rvr Surface	48.7	2.6	13.7				0.47			0.47	83	25	667	Yes	Yes
4-Oct	Lzy Rvr Surface	59.4	3.14								0.47	83	25	0	Yes	Yes
4-Oct	Lzy Rvr Bottom	47.7	2.16								0.47	83	25	667	Yes	Yes
5-Oct	Lzy Rvr Bottom*					2.26	0.47	1.75	20.6	21.5		0	0	0	No	Yes
Average		66.8	3.7	15.6	2.0	1.2	0.5	0.5	0.5	0.5	0.6	Average Values for Full Treatment Only				
Limit	240 ppb			*Medias in Lead								5-Oct Value changes due to Retention				

Table A-3. Zinc Concentration Through System

Zinc																
Date	Source	Influent	Clair	Geo	Post Sand	Post Bag	Post 1A	Post 1B	Post 1C	Post 1D	EFF	Ferric PPMv	Caustic PPMv	Sulfite PPMv	Polymer	Media
16-Sep	Main Surface	11.4				18.8					12.2	Filtration Only				
19-Sep	Main Surface										65.3	83	19	667	No	No
20-Sep	Main Surface	9.2			51.5	39.5	9.99	6.52	2.36	3.28	2.1	83	25	667	Yes	Yes
21-Sep	Main Surface										2.23	82	28	209	Yes	Yes
22-Sep	Main Surface										1.36	157	0	1000	Yes	Yes
23-Sep	Main Surface					30					4.08	53	0	453	Yes	Yes
28-Sep	Main 5'	11	73.2					10.7			2.6	82	25	657	Yes	Yes
29-Sep	Main 5'*	10.1	94.6	78.9		41.7	10.5	25	3.18	3.97		84	25	671	Yes	Yes
3-Oct	Lzy Rvr Surface	18.6	78.6	115				6.51			4.87	83	25	667	Yes	Yes
4-Oct	Lzy Rvr Surface	11.1	74.1								5.12	83	25	0	Yes	Yes
4-Oct	Lzy Rvr Bottom	10.9	81.3								6.64	83	25	667	Yes	Yes
5-Oct	Lzy Rvr Bottom*					2.56	15.8	12.1	16.4	21.1		0	0	0	No	Yes
Average		11.8	80.4	97.0	51.5	37.1	10.2	12.2	2.8	3.6	3.6	Average Values for Full Treatment Only				
Limit	100 ppb			*Medias in Lead								5-Oct Value changes due to Retention				

Highlighted squares indicate concentrations that exceed the discharge limit.

Table A-4. Thallium Concentration Through System

Thallium																
Date	Source	Influent	Clair	Geo	Post Sand	Post Bag	Post 1A	Post 1B	Post 1C	Post 1D	EFF	Ferric PPMv	Caustic PPMv	Sulfite PPMv	Polymer	Media
16-Sep	Main Surface	1.16				1.08					1.07	Filtration Only				
19-Sep	Main Surface										0.96	83	19	667	No	No
20-Sep	Main Surface	0.96			0.863	0.816	0.11				0.11	83	25	667	Yes	Yes
21-Sep	Main Surface										0.11	82	28	209	Yes	Yes
22-Sep	Main Surface										0.11	157	0	1000	Yes	Yes
23-Sep	Main Surface					0.777					0.11	53	0	453	Yes	Yes
28-Sep	Main 5'	1.06	1.01					0.11			0.11	82	25	657	Yes	Yes
29-Sep	Main 5'*	1.03	1.02	0.921		0.982	0.233	0.11	0.186	1.14		84	25	671	Yes	Yes
3-Oct	Lzy Rvr Surface	1.03	0.978	0.955				0.11			0.11	83	25	667	Yes	Yes
4-Oct	Lzy Rvr Surface	1.23	1								0.112	83	25	0	Yes	Yes
4-Oct	Lzy Rvr Bottom	0.96	1.98								0.113	83	25	667	Yes	Yes
5-Oct	Lzy Rvr Bottom*					0.805	0.582	0.11	0.151	0.757		0	0	0	No	Yes
Average		1.06	1.20	0.94	0.86	0.86	0.17	0.11	0.19	1.14	0.11	Average Values for Full Treatment Only				
Limit		0.9 ppb		*Medias in Lead								5-Oct Value changes due to Retention				

Highlighted squares indicate concentrations that exceed the discharge limit.

Appendix B – VPDES Permit No: VA0004146 Discharge Limits and Monitoring Requirements

Table B-1. VPDES Permit No: VA0004146 Discharge Limits and Monitoring Requirements

Table B-1. VPDES Permit No: VA0004146 Discharge Limits and Monitoring Requirements

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY AVERAGE (mg/L)	WEEKLY AVERAGE	DAILY MIN	DAILY MAX (mg/L)	FREQUENCY	SAMPLE TYPE
Aluminum (total)	NL	N/A	N/A	NL	1 per month	24-HC
Arsenic (total)	240	N/A	N/A	440	3 per week	4-HC
Barium (total)	NL	Na	Na	NL	1 per month	24-HC
Boron (total)	NL	N/A	N/A	NL	1 per month	24-HC
Cadmium (total)	1.4	N/A	N/A	2.6	3 per week	4-HC
Chloride	360	N/A	N/A	660	3 per week	4-HC
Chromium III (total)	100	N/A	N/A	190	3 per week	4-HC
Chromium VI (dissolved)	17	N/A	N/A	32	3 per week	4-Hc
Cobalt (total)	NL	N/A	N/A	NL	1 per month	24-HC
Copper (total)	11	N/A	N/A	20	3 per week	4-HC
Dissolved Oxygen	N/A	N/A	N/A	N/A	3 per week	Grab
Flow (MGD)	NL	N/A	N/A	5	Continuous	Measured
Hardness (CaCO ₃)	NL	N/A	N/A	NL	3 per week	4-HC
Hydrocarbons (TPH)	N/A	N/A	N/A	NL	1 per year	Grab
Iron (total)	NL	N/A	N/A	NL	1 per month	24-HC
Lead (total)	17	N/A	N/A	31	3 per week	4-HC
Mercury (total)	1.2	N/A	N/A	2.2	3 per week	4-HC
Molybdenum (total)	NL	N/A	N/A	NL	1 per month	24-HC
Nickel (total)	26	N/A	N/A	48	3 per week	4-HC
Oil and Grease (O&G)	15	N/A	N/A	20	3 per week	Grab
Organic Carbon (total)	N/A	N/A	N/A	110	1 per month	Grab

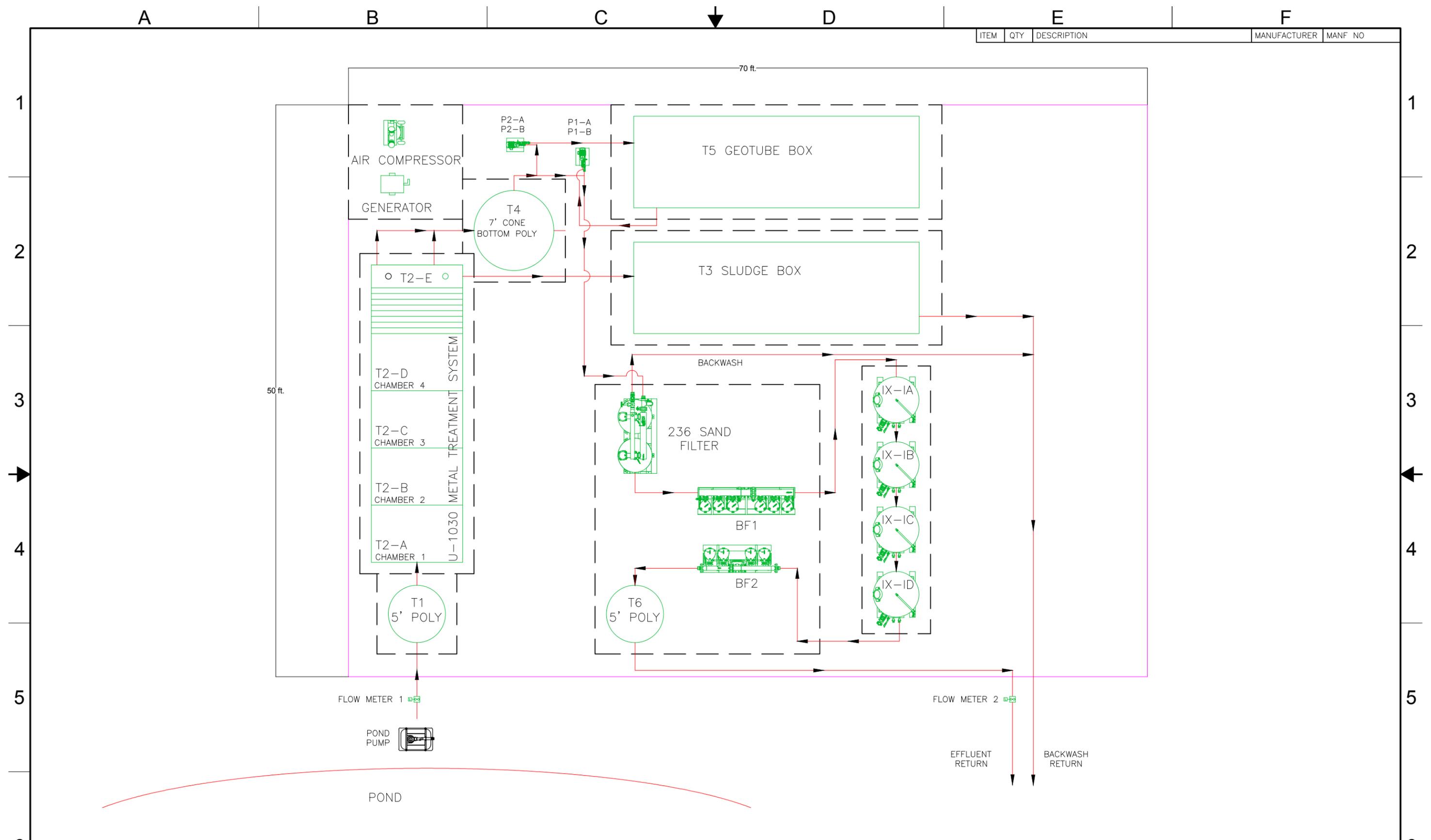
EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	MONTHLY AVERAGE (mg/L)	WEEKLY AVERAGE	DAILY MIN	DAILY MAX (mg/L)	FREQUENCY	SAMPLE TYPE
Organic Carbon (total)	N/A	N/A	N/A	110	1 per month	Grab
Residual Chlorine (µg/L)	18	N/A	N/A	32	3 per week	Grab
Selenium (total)	7.7	N/A	N/A	14	3 per week	4-HC
Silver (total)	2.7	N/A	N/A	5.0	3 per week	4-HC
Thallium (total)	0.9	N/A	N/A	0.9	3 per week	4-HC
Total Suspended Solids (TSS)	30	N/A	N/A	100	3 per week	Grab
Vanadium (total)	NL	N/A	N/A	NL	1 per month	24-HC
Zinc (total)	100	N/A	N/A	190	3 per week	4-HC

N/L = No limit

N/A = Not applicable

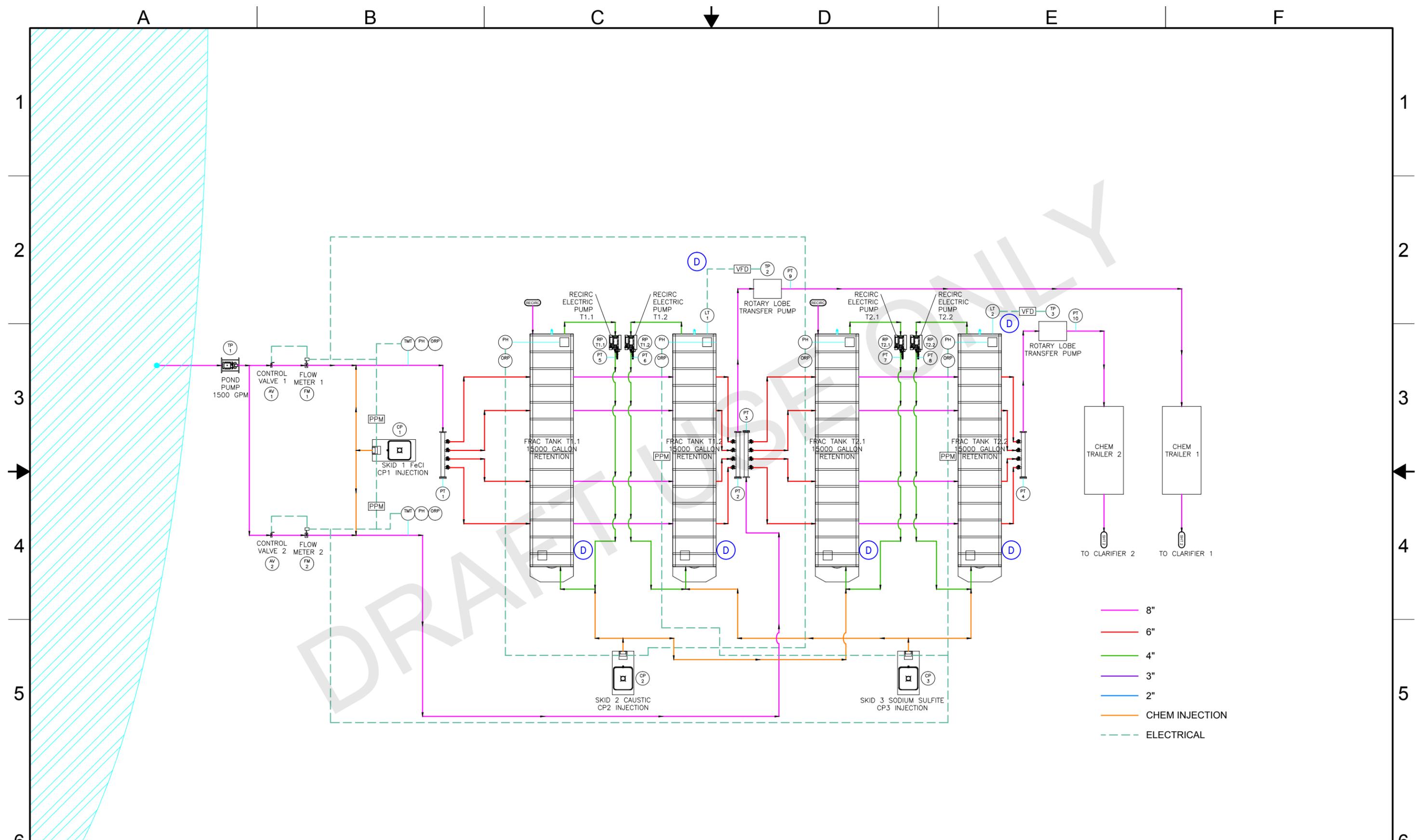
Appendix C – Process and Instrumentation Diagrams

Plan View and Process Flow – Recon Pilot	.....	C-2
Process Flow Diagram – 1500 gpm Water Treatment System	C-3



ITEM	QTY	DESCRIPTION	MANUFACTURER	MANF NO
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">REV</td> <td style="width: 10%;">DATE</td> <td style="width: 45%;">DESCRIPTION</td> <td style="width: 10%;">DRW</td> <td style="width: 10%;">APPR</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REV	DATE	DESCRIPTION	DRW	APPR						<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">DRAWING NO. M-001</td> <td style="width: 10%;">SIZE B</td> <td style="width: 10%;">SCALE NTS</td> <td style="width: 10%;">REV C</td> <td style="width: 30%;">JOB NO. 11128</td> </tr> <tr> <td>CUSTOMER</td> <td colspan="2">MATERIAL</td> <td> </td> <td> </td> </tr> <tr> <td colspan="2">DRAWN BY REN WILLIS</td> <td>DATE 9/15/2016</td> <td>SHEET 1</td> <td>UNIT NO.</td> </tr> </table>	DRAWING NO. M-001	SIZE B	SCALE NTS	REV C	JOB NO. 11128	CUSTOMER	MATERIAL				DRAWN BY REN WILLIS		DATE 9/15/2016	SHEET 1	UNIT NO.	<p>ProAct SERVICES CORPORATION</p>	<p>ALL INFORMATION CONTAINED IN THIS DOCUMENT ARE PROPRIETARY AND CONFIDENTIAL AND THE PROPERTY OF PROACT SERVICES CORPORATION. PATENT PENDING</p>	<p>PLAN VIEW & PROCESS FLOW RECON PILOT</p>
REV	DATE	DESCRIPTION	DRW	APPR																									
DRAWING NO. M-001	SIZE B	SCALE NTS	REV C	JOB NO. 11128																									
CUSTOMER	MATERIAL																												
DRAWN BY REN WILLIS		DATE 9/15/2016	SHEET 1	UNIT NO.																									



- 8"
- 6"
- 4"
- 3"
- 2"
- CHEM INJECTION
- - - ELECTRICAL

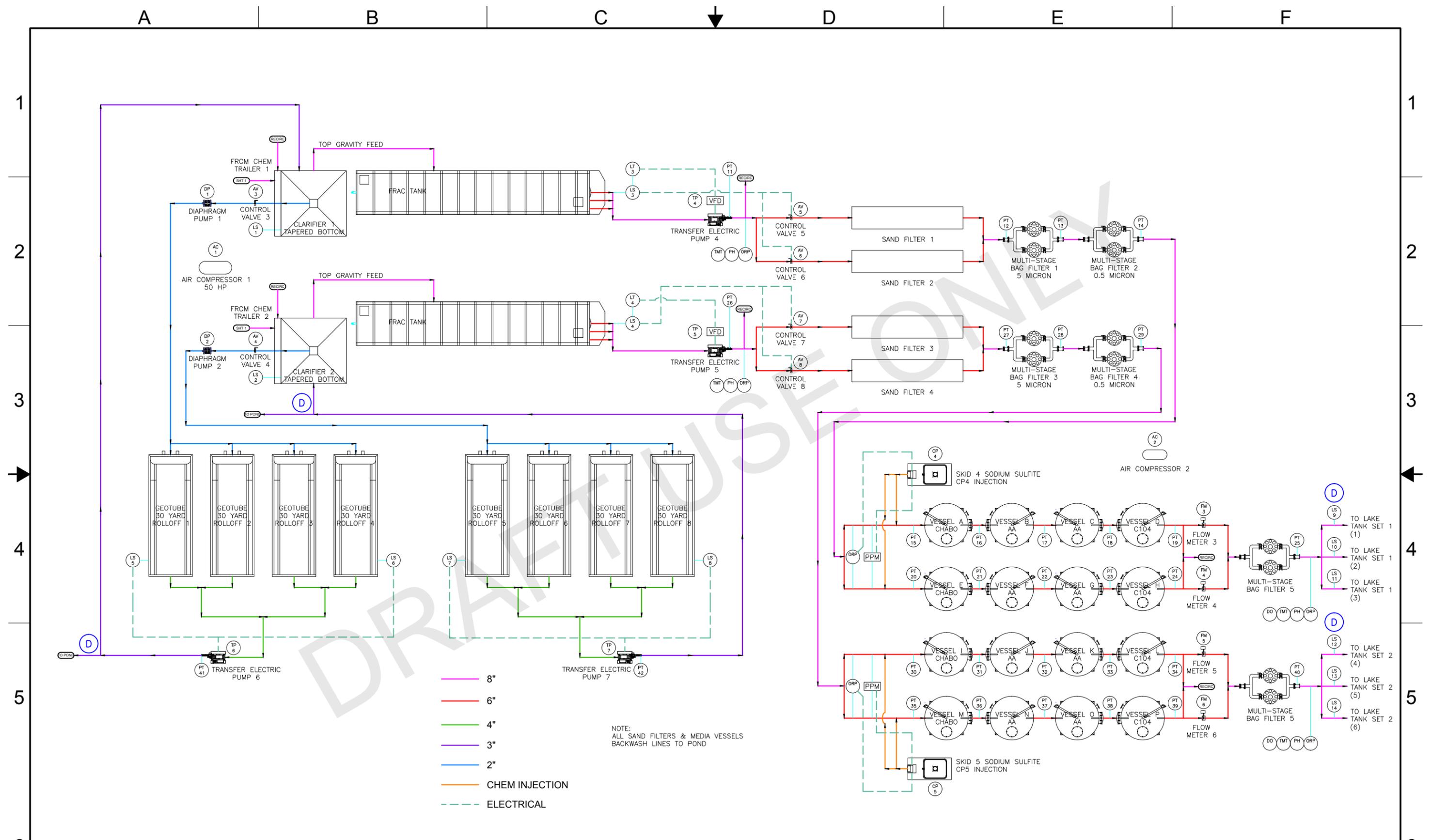
REV	DATE	DESCRIPTION	DRW	APPR
D	11/15/16	REMOVE MIXERS, UPDATE TP6, TP7 PLUMBING, NEW VFD, LT 15	SMT	
C	11/14/16	ADD PIPE SIZE CHART	SMT	
B	11/11/16	UPDATE CHEM INJECTION, VESSELS, ADD SHEET 2	SMT	
A	10/21/16	INITIAL DRAWING	SMT	

DRAWING NO. G-101		SIZE B	SCALE	REV D	JOB NO. 11128
CUSTOMER		MATERIAL			
DRAWN BY STEVE TURNER		DATE 10/21/16	SHEET 1	UNIT NO.	



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PROCESS FLOW DIAGRAM
1500 GPM WATER TREATMENT SYSTEM



- 8"
- 6"
- 4"
- 3"
- 2"
- CHEM INJECTION
- ELECTRICAL

NOTE:
ALL SAND FILTERS & MEDIA VESSELS
BACKWASH LINES TO POND

REV	DATE	DESCRIPTION	DRW	APPR
D	11/15/16	REMOVE MIXERS, UPDATE TP6, TP7 PLUMBING, NEW VFD, LT, LS	SMT	
C	11/14/16	ADD PIPE SIZE CHART	SMT	
B	11/1/16	UPDATE CHEM INJECTION, VESSELS, ADD SHEET 2	SMT	
A	10/21/16	INITIAL DRAWING	SMT	

DRAWING NO. G-101	SIZE B	SCALE	REV D	JOB NO. 11128
CUSTOMER	MATERIAL			
DRAWN BY STEVE TURNER	DATE 10/21/16	SHEET 2	UNIT NO.	



ALL INFORMATION CONTAINED IN THIS DOCUMENT ARE PROPRIETARY AND CONFIDENTIAL AND THE PROPERTY OF PROACT SERVICES CORPORATION. PATENT PENDING

PROCESS FLOW DIAGRAM
1500 GPM WATER TREATMENT SYSTEM

Appendix D – Itemized Lists of System Components and Instrumentation

Table D-1. Itemized List of Tanks	.....	D-2
Table D-2. Itemized List of Filtration Components	.....	D-2
Table D-3. Itemized List of Vessels	.....	D-3
Table D-4. Itemized List of Pumps	.....	D-3
Table D-5. Itemized List of Instrumentation Components	.....	D-4

Table D-1. Itemized List of Tanks

Name	Size [Gal]	Type
T1A	20,000	Frac Tank
T1B	20,000	Frac Tank
T2A	20,000	Frac Tank
T2B	20,000	Frac Tank
T3A	20,000	Frac Tank
T3B	20,000	Frac Tank
T4A	20,000	Frac Tank
T4B	20,000	Frac Tank

Table D-2. Itemized List of Filtration Components

Name	Size	Unit	Type
C1A			Clarifier
C1B			Clarifier
F1A	8000	gal.	Filter Box
F1B	8000	gal.	Filter Box
F2A	8000	gal.	Filter Box
F2B	8000	gal.	Filter Box
S1A	5.9	gpm/ft ²	4-54 Sand Filter
S1B	5.9	gpm/ft ²	4-54 Sand Filter
S2A	5.9	gpm/ft ²	4-54 Sand Filter
S2B	5.9	gpm/ft ²	4-54 Sand Filter
B1A1	46.9	gpm/bag	3636 Duplex Bag Filter
B1B1	46.9	gpm/bag	3636 Duplex Bag Filter
B1A2	46.9	gpm/bag	3636 Duplex Bag Filter
B1B2	46.9	gpm/bag	3636 Duplex Bag Filter
B2A1	46.9	gpm/bag	3636 Duplex Bag Filter
B2B1	46.9	gpm/bag	3636 Duplex Bag Filter
B2A2	46.9	gpm/bag	3636 Duplex Bag Filter
B2B2	46.9	gpm/bag	3636 Duplex Bag Filter
G1A	25	yd ³	GeoTube
G1B	25	yd ³	GeoTube
G2A	25	yd ³	GeoTube
G2B	25	yd ³	GeoTube
G3A	25	yd ³	GeoTube
G3B	25	yd ³	GeoTube
G4A	25	yd ³	GeoTube
G4B	25	yd ³	GeoTube

Table D-3. Itemized List of Vessels

Name	Size [ft ²]	Media
V1A1	50	Chabazite
V1B1	50	Chabazite
V1A2	50	Chabazite
V1B2	50	Chabazite
V2A1	50	Activated Alumina
V2B1	50	Activated Alumina
V2A2	50	Activated Alumina
V2B2	50	Activated Alumina
V3A1	50	Activated Alumina
V3B1	50	Activated Alumina
V3A2	50	Activated Alumina
V3B2	50	Activated Alumina
V4A1	50	C104Na
V4B1	50	C104Na
V4A2	50	C104Na
V4B2	50	C104Na

Table D-4. Itemized List of Pumps

Name	Size [gpm]
Pond Pump	1500
TP1	750
TP2	750
TP3	250
TP4	250
RP1A	250
RP1B	250
RP2A	250
RP2B	250
RP3A	250
RP3B	250
RP4A	250
RP4B	250

Table D-5. Itemized List of Instrumentation Components

Name	Type	Alarm Function
FM1A	Flow Meter	High/Low Alarm
FM1B	Flow Meter	High/Low Alarm
FM2A1	Flow Meter	High/Low Alarm
FM2B1	Flow Meter	High/Low Alarm
FM2A2	Flow Meter	High/Low Alarm
FM2B2	Flow Meter	High/Low Alarm
FM3A1	Flow Meter	High/Low Alarm
FM3B1	Flow Meter	High/Low Alarm
FM3A2	Flow Meter	High/Low Alarm
FM3B2	Flow Meter	High/Low Alarm
TM1A	Turbidity	High Alarm
TM1B	Turbidity	High Alarm
TM2A	Turbidity	High Alarm
TM2B	Turbidity	High Alarm
LT1A	Level Transducer	High/Low Alarm
LT1B	Level Transducer	High/Low Alarm
LT2A	Level Transducer	High/Low Alarm
LT2B	Level Transducer	High/Low Alarm
LT3A	Level Transducer	High/Low Alarm
LT3B	Level Transducer	High/Low Alarm
LT4A	Level Transducer	High/Low Alarm
LT4B	Level Transducer	High/Low Alarm
LT5A	Level Transducer	High/Low Alarm
LT5B	Level Transducer	High/Low Alarm
LS1A	Level Switch	High High Shut Off
LS1B	Level Switch	High High Shut Off
LS2A	Level Switch	High High Shut Off
LS2B	Level Switch	High High Shut Off
PT1	Pressure Transducer	High/Low Alarm
PT2	Pressure Transducer	High/Low Alarm
PT3	Pressure Transducer	High/Low Alarm
PT4	Pressure Transducer	High/Low Alarm
PT5	Pressure Transducer	High/Low Alarm
PT6	Pressure Transducer	High/Low Alarm
PT7	Pressure Transducer	High/Low Alarm
PT8	Pressure Transducer	High/Low Alarm
PT9	Pressure Transducer	High/Low Alarm
PT10	Pressure Transducer	High/Low Alarm
PT11	Pressure Transducer	High/Low Alarm
PT12	Pressure Transducer	High/Low Alarm
PT13	Pressure Transducer	High/Low Alarm

Name	Type	Alarm Function
PT14	Pressure Transducer	High/Low Alarm
PT15	Pressure Transducer	High/Low Alarm
PT16	Pressure Transducer	High/Low Alarm
PT17	Pressure Transducer	High/Low Alarm
PT18	Pressure Transducer	High/Low Alarm
PT19	Pressure Transducer	High/Low Alarm
PT20	Pressure Transducer	High/Low Alarm
PT21	Pressure Transducer	High/Low Alarm
PT22	Pressure Transducer	High/Low Alarm
PT23	Pressure Transducer	High/Low Alarm
PT24	Pressure Transducer	High/Low Alarm
PT25	Pressure Transducer	High/Low Alarm
PT26	Pressure Transducer	High/Low Alarm
PT27	Pressure Transducer	High/Low Alarm
PT28	Pressure Transducer	High/Low Alarm
PT29	Pressure Transducer	High/Low Alarm
PT30	Pressure Transducer	High/Low Alarm
PH0A	pH Transducer	High/Low Alarm
PH0B	pH Transducer	High/Low Alarm
PH1A	pH Transducer	High/Low Alarm
PH1B	pH Transducer	High/Low Alarm
PH2A	pH Transducer	High/Low Alarm
PH2B	pH Transducer	High/Low Alarm
PH3A	pH Transducer	High/Low Alarm
PH3B	pH Transducer	High/Low Alarm
PH4A	pH Transducer	High/Low Alarm
PH4B	pH Transducer	High/Low Alarm
ORP0A	ORP Transducer	High/Low Alarm
ORP0B	ORP Transducer	High/Low Alarm
ORP1A	ORP Transducer	High/Low Alarm
ORP1B	ORP Transducer	High/Low Alarm
ORP2A	ORP Transducer	High/Low Alarm
ORP2B	ORP Transducer	High/Low Alarm
ORP3A	ORP Transducer	High/Low Alarm
ORP3B	ORP Transducer	High/Low Alarm
ORP4A	ORP Transducer	High/Low Alarm
ORP4B	ORP Transducer	High/Low Alarm
ORP5A1	ORP Transducer	High/Low Alarm
ORP5B1	ORP Transducer	High/Low Alarm
ORP5A2	ORP Transducer	High/Low Alarm
ORP5B2	ORP Transducer	High/Low Alarm

Appendix E – Sample Points

Table E-1. Sample Points

Table E-1. Sample Points

Location	Type	Frequency
Influent	Visual/Lab	2 hr./week
T1A	Visual	2 hr.
T1B	Visual	2 hr.
T2A	Visual	2 hr.
T2B	Visual	2 hr.
T3A	Visual	2 hr.
T3B	Visual	2 hr.
T4A	Visual	2 hr.
T4B	Visual	2 hr.
Clarifier	Visual/Lab	2 hr./week
Filter Box	Visual	2 hr.
Sand Pod	Visual	2 hr.
Bag Filters 1	Visual	2 hr.



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE

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David K. Paylor
Director

Jeffery Steers
Regional Director

Molly Joseph Ward
Secretary of Natural Resources

July 7, 2017

Jason E. Williams
Manager, Generation Environmental Services
Chesterfield Power Station
Transmitted via email: Jason.E.Williams@dominionenergy.com

Re: Centralized Source Water Treatment System Concept Engineering Report
VA0004146 – Chesterfield Power Station

Dear Mr. Williams:

Thank you for submitting the above referenced Concept Engineering Report (CER) in accordance with Part I.C.20 of VPDES Permit VA0004146 which became effective on October 1, 2016. The Department of Environmental Quality (DEQ) has reviewed the CER and requests additional information as specified below in order to complete its review.

With regard to design:

- a. Provide a separate section describing the Collection System(s) to be utilized in conveying the source waters to the treatment system. This section should include a general list of the equipment components of the collection system(s) and their size, volume, and/or flow rates.
- b. Provide a separate section with a general list of the equipment components of the Treatment System, including their size, volume, and/or flow rates. This section should include information regarding the equipment components of the Enhanced Treatment System and Storage Tanks.

With regard to operation:

- a. Incorporate the size, volume, and/or flow rates noted above into the existing descriptions of the Treatment Process (4.1), Enhanced Treatment (4.2), and Storage Tanks (5.0).

Enclosed please find a copy of the approved Breomo Bluff Centralized Source Water Treatment System CER which may be helpful in responding to our request for additional information. Specifically, sections 4.1 and 4.2 of the Breomo CER provide a general format that may be utilized in the CER for the Chesterfield Power Station regarding the Collection System and Treatment System Components. Please contact Joseph Bryan at (804) 527-5012 or via email at Joseph.Bryan@deq.virginia.gov if you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kyle Ivar Winter".

Kyle Ivar Winter, P.E.
Deputy Regional Director

cc: Kenneth Roller, Dominion



May 25, 2017

Ms. Emilee Adamson
VPDES Permit Manager
Virginia Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060

Re: Submittal of Concept Engineering Report for Centralized Source Water Treatment System (CSWTS), VPDES Permit No. VA0004146, Chesterfield Power Station

Dear Ms. Adamson:

Dominion is submitting the attached Concept Engineering Report (CER) for the Centralized Source Water Treatment System (CSWTS) at the Chesterfield Power Station. The attached CER describes the components that will be used to treat the source waters from the decanting and dewatering of the Upper and Lower Ash Ponds.

This CER is being submitted in accordance with Special Condition I.C.20 of VPDES Permit VA0004146. As such, we are requesting DEQ's review and approval of the CER so that we may proceed with the design and installation of the CSWTS.

If you have any questions, please contact Ken Roller at Kenneth.Roller@dom.com.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,



Jason E. Williams
Manager
Generation Environmental Services

Attachment



Concept Engineering Report
Centralized Source Water Treatment System

A world of
capabilities
delivered locally

CONCEPT ENGINEERING REPORT

CENTRALIZED SOURCE WATER TREATMENT SYSTEM

CHESTERFIELD POWER STATION
VPDES Permit No. VA0004146



Dominion

Submitted To: Dominion – Chesterfield Power Station
500 Coxendale Road
Chester, VA 23836

Submitted By: Golder Associates, Inc.
2108 W. Laburnum Avenue
Suite 200
Richmond, VA 23227



May 2017

1520610



Table of Contents

1.0	INTRODUCTION.....	1
1.1	Site Description	2
2.0	SOURCE WATERS	2
2.1	Lower Ash Pond Decant Water.....	2
2.2	Ash Pond Contact Stormwater.....	3
2.3	Ash Pond Ash Dewatering Water.....	3
3.0	SOURCE WATER CHARACTERISTICS.....	3
4.0	TREATABILITY	4
4.1	Treatment Process.....	4
4.2	Enhanced Treatment (if necessary).....	6
5.0	STORAGE TANKS.....	7

Tables

Table 1 – Summary of Constituents in Lower Ash Pond and Upper Ash Pond

Table 2 – CSWTS Process Chemicals and Polymers

Drawings

Drawing 1 – Station Outfalls and Facilities

Drawing 2 – Centralized Source Water Treatment System (CSWTS) Site Plan

Drawing 3 – Source Water Piezometer and Decant Water Sample Locations

Drawing 4 – Process Flow Diagram

Drawing 5 – Conceptual Optional Influent/Effluent Storage Tank Schematic

Appendices

Appendix A – GWTT’s Treatability Study

1.0 INTRODUCTION

This Concept Engineering Report (CER) has been prepared for the proposed Centralized Source Water Treatment System (CSWTS) at Dominion's Chesterfield Power Station (Station), in accordance with the Station's Virginia Pollutant Discharge Elimination System (VPDES) Permit No. VA0004146 (VPDES Permit). The Station is the largest fossil-fueled power station in Virginia, capable of generating more than 1,600 megawatts, and is fueled mainly by coal. Coal Combustion Residuals (CCR) from coal-fired operations are currently stored in two surface impoundments on-site, the Upper Ash Pond (UAP) and the Lower Ash Pond (LAP).

Dominion is closing the Upper and Lower Ash Ponds in accordance with the U.S. Environmental Protection Agency's final CCR rule, which is codified in 40 CFR 257 and has been adopted by reference into the Virginia Solid Waste Management Regulations (VSWMR) at 9VAC20-81-10 *et seq.* In response to the final rule, the Station is converting from a wet CCR management system to a dry CCR management system. Station wastewater and contact stormwater are currently sent to the LAP for treatment and discharge through Outfall 004. As part of the conversion, a new Low Volume Wastewater Treatment System (LVWWTs) will be constructed to replace the LAP for treatment of the Station's wastewater streams. Following construction and commissioning of the LVWWTs, treated wastewaters will be discharged through internal Outfall 301.

Once the Station's wastewater streams have been permanently rerouted from the LAP to the LVWWTs and discharge through internal Outfall 301 commences, the surface water in the LAP will be allowed to drain over the existing unmodified weir utilizing the existing standard LAP operating procedures. After the gravity discharge ends, the weir will be raised and Outfall 004 will be plugged to prevent further discharges.

In accordance with Special Condition I.C.24 of the Station's VPDES permit, drawdown will commence with the intentional lowering of the pond elevation below 2 feet 2 inches from the top of the concrete outfall structure of Outfall 004 (for the LAP) and 15 feet 6 inches from the top of the concrete outfall structure of Outfall 005 (for the UAP sedimentation basin). Following the commencement of drawdown, wastewaters from the decanting and dewatering of the pond in which the drawdown was initiated will be directed to the CSWTS that is the subject of this CER. Wastewaters treated in the CSWTS will be discharged through internal Outfall 101. The discharge through internal Outfall 101 will be metered and sampled for compliance with the required effluent limitations in the Station's VPDES Permit. Prior to the commencement of the discharge of drawdown water from the Upper or Lower Ash Ponds, a notification will be submitted to the DEQ in accordance with Special Condition I.C.24 of the permit. A second notification will be provided within 24 hours after initiating the discharge of drawdown water from the Upper or Lower Ash Ponds.

Dominion has prepared this CER to provide a description of the proposed CSWTS that has been specifically designed to comply with the numeric effluent limitations in Part I.A.2 of the permit. The conceptual

engineering systems and processes presented herein reflect the planned conceptual approach for the CSWTS and may not reflect the specific details of the final design system configuration. Written notification will be submitted to the DEQ in accordance with Special Condition I.C.20 of the permit certifying that, based on an inspection of the project, construction of the CSWTS was completed in accordance with the CER.

1.1 Site Description

The Chesterfield Power Station is located in Chesterfield County, Virginia, at 500 Coxendale Road just east of I-95 and south of the James River. A map of the Station and the Station's outfalls is shown on an aerial photograph as Drawing 1. The Station's property consists mainly of wooded, open, and developed land. The eastern, southern, and western boundaries of the property are bordered by undeveloped land, tidal flats, and river bottom associated with the Old Channel of the James River. The northern and northeastern boundaries border Henricus Historical Park, undeveloped land, and the James River.

The proposed CSWTS is located southeast of the Station's generating facilities and north of Coxendale Road on Dominion property. A site plan with the proposed CSTWS location is presented on an aerial photograph as Drawing 2.

2.0 SOURCE WATERS

Source waters from the LAP and the UAP sedimentation basin include Lower Ash Pond Decant Water, Ash Pond Contact Stormwater, and Ash Pond Dewatering Water as described below. All source waters will be treated as described in Section 4.0 and subject to the triggers for enhanced treatment as identified in Section 4.2. Treatment system effluent will ultimately be discharged to Outfall 001 or Outfall 002 via internal Outfall 101. Source waters may be conveyed to the LAP, the temporary influent storage tanks, and/or to the start of the treatment system. Source waters may also be temporarily stored in the UAP sedimentation basin, as necessary, during the LAP decanting and dewatering process and prior to starting the decanting and dewatering process in the UAP sedimentation basin (in this situation there would be no discharge from Outfall 005).

2.1 Lower Ash Pond Decant Water

The LAP Decant Water includes surface waters that result from the mixing of a number of wastewater types in the LAP, including, but not limited to: stormwater, low volume wastewater, ash dewatering water, ash sluice water, non-chemical cleaning wastes, chemical cleaning wastes via the metals pond, coal pile runoff, flue gas desulfurization (FGD) wastewater treatment plant effluent, screen backwash associated with the reuse of Proctors Creek wastewater treatment plant effluent, and wastewater from the Station's car wash (non-chemical). It will be necessary to decant the LAP in order to dewater the CCR in the LAP.

2.2 Ash Pond Contact Stormwater

Ash Pond Contact Stormwater is stormwater that has come into contact with the CCR in the Upper and Lower Ash Ponds. Contact stormwater in the UAP is currently routed to the UAP sedimentation basin in the eastern end of the pond and is considered process wastewater. Under the existing VPDES permit, contact stormwater in the UAP sedimentation basin may be directed to Outfall 005 or to the LAP to discharge through Outfall 004. Once drawdown of the UAP sedimentation basin is initiated, as defined in Special Condition I.C.24 of the permit, the UAP contact stormwater will be sent to the CSWTS either by way of the LAP (if still available) or through a direct pipe connection.

2.3 Ash Pond Ash Dewatering Water

Ash Pond Ash Dewatering Water is considered to be the pore water within the CCR mass in the LAP and in the UAP sedimentation basin. This source water refers to the water that is produced from dewatering the CCR in order to stabilize the CCR. The Ash Pond Ash Dewatering Water is generated from the CCR dewatering process through mechanical means (e.g., vacuum wells, sump pumps, or other *in situ* withdrawal methods) and/or from passive methods (e.g., cutting drainage ditches or rim ditches into the CCR mass).

3.0 SOURCE WATER CHARACTERISTICS

To characterize the expected quality of source waters that will be treated in the CSWTS, a series of four sampling events was conducted between May and July 2016 by Golder Associates Inc., an independent consultant to Dominion. During each event, six samples were obtained from piezometers installed in the CCR mass, and four samples were obtained from surface water in the LAP and the UAP sedimentation basin. Additionally, a fifth surface water sample (S-5) was obtained from the LAP during the July sampling event. The samples were collected from representative locations within the source streams (Drawing 3).

During each sampling event for each source water, representative samples were collected using appropriate equipment by qualified sample technicians following U.S. Environmental Protection Agency (EPA) surface water sampling protocols and industry standards for groundwater (*i.e.*, piezometer) sampling.

The samples were collected in laboratory-provided, pre-preserved, pre-labeled sample containers and placed on ice in a cooler under chain-of-custody control pending delivery to the laboratory for analysis. Samples for analysis by Pace Analytical Services, Inc. (PACE) of Huntersville, North Carolina were shipped to PACE via commercial overnight courier under chain-of-custody control. PACE and their subcontractor laboratories are Virginia Environmental Laboratory Accreditation Program (VELAP) accredited laboratories for the analyses performed. The results of the laboratory analyses for those constituents subject to numeric effluent limitations in the VPDES Permit are presented in Table 1.

The surface water samples S-1 through S-5 are representative of both the LAP Decant Water and Ash Pond Contact Stormwater quality prior to any additional treatment. Constituent concentrations measured in one or more of these samples (S-1 through S-5) exceeded the applicable CSWTS effluent limitations for internal Outfall 101 in the Station's VPDES permit.

The samples collected from the six piezometers (PZ-1 through PZ-6) are representative of the expected Ash Pond Ash Dewatering Water quality prior to any additional treatment. Constituent concentrations measured in one or more of these samples also exceeded the applicable CSWTS effluent limitations in the Station's VPDES permit.

4.0 TREATABILITY

In order to design a water treatment system that achieves the required effluent limitations in the Station's VPDES Permit, the selected water treatment vendor, Ground/Water Treatment & Technology (GWTT), completed a treatability study for the expected source waters to the CSWTS (see Appendix A). The study consisted of both bench-scale and pilot study tests examining chemical selection, chemical addition levels, and treatment process effectiveness. Bench-scale tests were used to evaluate proposed chemical usage, and the chemicals and dosages that worked most effectively given the source water characteristics were recommended for implementation. A pilot study was used to test the proposed treatment system design as a whole and demonstrate efficacy of the overall system design. During the pilot study, process design options such as pH levels and contact time between water and media were varied to challenge the system design. The pilot study was able to demonstrate the ability of the designed treatment process to achieve effluent concentrations below levels established in the Station's VPDES Permit.

The conclusion of the pilot study suggests that the proposed treatment process utilizing chemical oxidation/reduction, chemical coagulation, chemical flocculation, gravity settling, mechanical filtration, and enhanced treatment using adsorptive media (as needed) will effectively treat the source waters as described in Section 2.0 to the required effluent limitations in the VPDES Permit. A treatment process flow diagram illustrating the conceptual treatment system design is shown in Drawing 4. The decision about which processes to run on any given day will be made based on influent quality, in-line process sampling, and/or best professional judgment to maximize treatment efficiency and effectiveness.

4.1 Treatment Process

The CSWTS process will begin with an influent tank divided into three chambers. The first chamber will be used for chemical addition to oxidize dissolved metals. A list of chemicals that may be used (as needed) in the treatment process is provided in Table 2. Any chemical listed in Table 2 may be added at any location in the treatment system to enhance treatment and/or maintain the effluent limitations [e.g., pH within the range of 6-9 Standard Units (SU)]. Air may also be injected into the influent tank in order to oxidize the dissolved metals. The aeration equipment used with the tank may be turned on or off as needed for

treatment. The final chamber will be used to monitor the water's properties, such as pH. Mixers will be installed within the tank to ensure proper mixing of the chemicals, water, and air (if needed). The mixers will be turned on and off as needed.

After the influent tank, water will flow into the first pH adjustment tank. Chemical addition may be used to adjust the pH to reduce the solubility of metals that may be in the water. Mixers will be installed within the pH adjustment tank to ensure proper mixing of the chemicals and the water, and the mixers will be turned on or off as needed.

Next, the water will enter a chemical mix tank where coagulants and flocculants will be added, as needed. A list of the coagulants and flocculants that may be added are included in Table 2. Coagulation will be used to change the electrical charge of the fine particles and cause the particles to destabilize. Flocculation will be used to bring the charged particles together and make them heavier, allowing for better settling out of the particles. Mixers will be installed within the chemical mix tank to ensure proper mixing of the chemicals and the water, and the mixers will be turned on or off as needed.

After the chemical mix tank, water will be conveyed to clarifiers for removal of suspended particles through the use of gravity, allowing heavier particles to settle out of the water over time. The solids that collect at the bottom of the clarifiers will be periodically transferred to a solids holding tank. In the holding tank, the solids will condense at the bottom and the free water at the top may then be recirculated to the start of the treatment system. A filter press will be used to help facilitate the solids dewatering process. The dewatered solids will be managed as a special waste under VSWMR, and will be characterized as required by the VSWMR and the permitted disposal facility selected to receive the waste.

After the clarifiers, treated water may be recirculated for further treatment or storage, or pumped to the filtration systems.

A series of filtration systems will be used to purify the treated water. The filtration systems will use bag filters and/or cartridge filters and may run in series or parallel in order to maximize treatment. Bag and/or cartridge filter systems will be used to remove TSS, sediment, and filterable metals from the water. The micron rating of the filters used in these systems will be selected based on treatment needs. Spent filters will be disposed of in an approved landfill. These filtration units may also utilize backwashing to help clear built-up particles removed from the water and increase the life of the filters. The backwash water will be recycled to the LAP, directed to the optional influent storage tanks, or directed back to the start of the treatment system.

After the series of filtration systems, the treated water will pass through an in-line process sampling point (S1) before continuing on to a holding tank. This holding tank will be used to monitor and adjust final effluent pH using chemicals and mixers, as needed, as well as monitor other water properties, such as turbidity.

Lastly, the treated water will be pumped to the optional effluent storage tanks, recirculated to the LAP, recirculated to the optional influent tanks, recirculated through the system for additional treatment, or pumped directly to discharge through internal Outfall 101.

Periodic sampling of the water at any point in the treatment process may be used to monitor constituent levels. Sampling of the final effluent will be conducted in accordance with the Station's VPDES Permit to comply with Parts I.A.2 and I.C.17. Storage capacity for the effluent from the CSWTS will be provided, as needed, to effectively manage the treated water, as described in Section 5.0. The storage of treated water in temporary effluent storage tanks allows Dominion the option to sample and analyze the water to ensure VPDES Permit compliance prior to discharge to internal Outfall 101. Internal Outfall 101 will be metered and sampled for compliance with the VPDES Permit. If effluent storage is used, effluent monitoring for compliance with the VPDES Permit will be performed on the effluent from the storage vessel(s). From internal Outfall 101, effluent will be routed to Outfall 001 or Outfall 002 for ultimate discharge.

4.2 Enhanced Treatment (if necessary)

Enhanced treatment includes the use of adsorptive media and/or chemical addition, as necessary, for improved constituent removal. When process water is not being routed through enhanced treatment, in-line process samples will be collected at a minimum frequency of once every four hours at an in-line process sampling point (S1), and analytical results will be returned within approximately one (1) hour after sample collection. This sampling is in addition to the effluent compliance sampling required by the VPDES permit. If effluent from the treatment system exceeds any of the trigger concentrations presented below, as determined by the in-line process sampling and analysis from the in-line process sampling point (S1), then the effluent will be routed through enhanced treatment. The trigger concentrations are as follows:

- Arsenic – 100 micrograms per liter (ug/L)
- Antimony – 640 ug/L
- Selenium – 5.0 ug/L
- Thallium – 0.47 ug/L
- Lead – 7.4 ug/L
- Copper – 6.0 ug/L

The enhanced treatment may be turned off should the in-line process sampling and analysis determine that concentrations prior to the enhanced treatment are below the trigger limits. While enhanced treatment is used, in-line process sample collection is optional until the time in-line process sampling and analysis from the in-line process sample point (S1) is needed to indicate that concentrations prior to the enhanced treatment are below the trigger limits. Only after this indication will enhanced treatment be turned off. Dominion reserves the right to operate any component of the enhanced treatment system at any time even if trigger limits have not been exceeded.

A monthly report will be submitted to the DEQ that will provide the dates and times when enhanced treatment was turned on and off. The in-line process samples will be grab samples and will be analyzed using methods that will achieve the Quantification Levels (QLs) specified in the Station's VPDES Permit. A log will be maintained with the in-line process sampling results and the times that enhanced treatment begins and ends. The log will be available to the DEQ upon request.

Enhanced treatment may occur, as needed, directly after water passes through the in-line process sampling point (S1). Water will first enter a pH adjustment tank. The pH will be adjusted, as needed, to bring the water to an optimum level prior to entering further enhanced treatment. Mixers will be installed within the pH adjustment tank to ensure proper mixing of the chemicals and the water, and the mixers will be turned on or off as needed. From the pH adjustment tank, water will be pumped to the enhanced treatment trains set up to run in series or in parallel depending on treatment needs. Each enhanced treatment train will include a series of vessels that will be filled with a proprietary mixture of adsorptive media for targeted particulate removal. This proprietary mixture is designed to reduce the concentrations of dissolved metals in the water. The effluent may be routed through part or all of each treatment train, and the number of vessels in each enhanced treatment train may be adjusted (i.e., additional lead and/or lag vessels as needed), based on treatment needs. Backwashing to clean out built-up particulates may be used to prolong the life of the media used during enhanced treatment. Backwash wastewater will be recirculated to the LAP, routed to the influent storage tanks, and/or routed to the start of the treatment system.

Periodic sampling of the effluent from the enhanced treatment process may be used to determine if dissolved metals breakthrough is occurring. This information will be used to determine when to replace the media, as well as determine the effectiveness of the enhanced treatment components.

5.0 STORAGE TANKS

Temporary effluent storage tanks may be used as an option to provide hydraulic retention of treated effluent prior to discharge (Drawing 5). The temporary storage tanks may be used in conjunction with the CSWTS. If used, the storage tanks will be erected southeast of the Station's generating facilities and north of Coxendale Road on Dominion property (see Drawing 2) and set on a compacted aggregate base. The inside of the tanks will provide water-tight containment, and the prepared area will be provided with spill containment. Internal Outfall 101 will be the metered outfall compliance sampling location.

Process monitoring may be performed on the influent side of the tanks and/or within the tanks at various times to confirm the CSWTS is operating as designed to meet the VPDES permitted effluent limits prior to discharge. In the event that the process monitoring indicates the designed level of treatment is not being achieved, the stored effluent can then be recirculated back through the system for additional treatment or recirculated to the optional influent tanks or the LAP.

Effluent tanks may be repurposed as influent storage tanks to accommodate periods of low-flow operations or peak contact stormwater generation to effectively manage influent water quantities. An optional influent line may be used to transfer source waters as described in Section 2.0 to the optional influent storage tanks. The recirculation line may be used, as needed, to transfer the stored influent to the CSWTS.

END OF DOCUMENT

TABLES

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5	
								Unit	Result	Qualifier	Result																		
Aluminum																													
05/13-16/2016	E200.7	T					ug/L	1410		841		1270		1460		2480		7790		462		681		377		260		--	
05/13-16/2016	E200.7	D					ug/L	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	--		--		--		--		--	
05/25-26/2016	E200.7	T					ug/L	1100		441		5030		301		3500		805		706		580		733		606		--	
05/25-26/2016	E200.7	D					ug/L	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	< 50.0	U	--		--		--		--		--	
06/23/2016	E200.7	T					ug/L	371		< 50.0	U	72.8	J	< 50.0	U	< 50.0	U	< 50.0	U	426		152		< 50.0	U	145		--	
06/23/2016	E200.7	D					ug/L	< 50.0	U	< 50.0	U	51.2	J	< 50.0	U	< 50.0	U	< 50.0	U	53.9	J	152		< 50.0	U	137		--	
07/22/2016	E200.7	T					ug/L	157		1280		9770		2670		1080		1180		489		501		6450		1040		6450	
07/22/2016	E200.7	D					ug/L	< 50.0	U	51.0	J	51.2	J	< 50.0	U	788		1600		361		316		795		470		795	
Ammonia Nitrogen																													
05/13-16/2016	E350.1	N					mg/L	9.7		1.6		0.098	J	0.056	J	0.56		< 0.050	U	0.094	J	< 0.050	U	0.14		< 0.050	U	--	
05/25-26/2016	E350.1	N					mg/L	7.2		0.51		< 0.050	U	< 0.050	U	0.52		< 0.050	U	0.41		0.48		< 0.050	U	< 0.050	U	--	
Antimony																													
05/13-16/2016	E200.8	T	1300		1300		ug/L	< 0.50	U	1.2		< 0.50	U	< 0.50	U	< 0.50	U	0.96	J	4.6		4.8		< 0.50	U	7.5		--	
05/13-16/2016	E200.8	D	1300		1300		ug/L	< 0.50	U	1.2		< 0.50	U	--		--		--		--		--							
05/25-26/2016	E200.8	T	1300		1300		ug/L	< 0.50	U	< 2.5		< 2.5	U	< 0.50	U	< 2.5	U	< 0.50	U	4.8		5.3		< 0.50	U	7.6		--	
05/25-26/2016	E200.8	D	1300		1300		ug/L	< 0.50	U	< 1.0	U	< 1.0	U	< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--	
06/23/2016	E200.8	T	1300		1300		ug/L	< 0.50	U	< 0.50	U	1.6		< 0.50	U	< 0.50	U	< 0.50	U	6.8		8.6		< 0.50	U	14.9		--	
06/23/2016	E200.8	D	1300		1300		ug/L	< 0.50	U	< 0.50	U	1.7		< 0.50	U	< 0.50	U	< 0.50	U	6.9		8.5		< 0.50	U	15.4		--	
07/22/2016	E200.8	T	1300		1300		ug/L	< 0.50	U	< 0.50	U	5.0		< 0.50	U	< 0.50	U	< 0.50	U	8.5		8.7		10.9		11.7		10.9	
07/22/2016	E200.8	D	1300		1300		ug/L	< 0.50	U	< 0.50	U	1.0		< 0.50	U	< 0.50	U	< 0.50	U	9.0		8.7		10.2		11.8		10.2	
Arsenic																													
05/13-16/2016	E200.8	T	440		240		ug/L	34.8		736		1500		2470		918		75.2		33.6		31.0		16.6		35.0		--	
05/13-16/2016	E200.8	D	440		240		ug/L	1.0		209		1020		316		52.4		2.0		--		--		--		--		--	
05/25-26/2016	E200.8	T	440		240		ug/L	27.5		1080		1210		3020		1080		49.3		31.7		27.6		14.1		37.0		--	
05/25-26/2016	E200.8	D	440		240		ug/L	< 0.50	U	593		825		387		182		6.2		--		--		--		--		--	
06/23/2016	E200.8	T	440		240		ug/L	74.9		1110		442		2880		1390		53.6		73.1		53.7		11.8		50.3		--	
06/23/2016	E200.8	D	440		240		ug/L	67.0		1170		444		3030		1450		57.1		71.6		53.4		11.6		51.8		--	
07/22/2016	E200.8	T	440		240		ug/L	182		866		425		2810		1220		57.4		73.2		72.7		86.2		26.7		86.2	
07/22/2016	E200.8	D	440		240		ug/L	77.6		927		942		2800		1230		57.4		72.2		74.0		71.3		24.5		71.3	
Barium																													
05/13-16/2016	E200.7	T					ug/L	255		130		326		786		107		277		236		188		24.2		69.7		--	
05/13-16/2016	E200.7	D					ug/L	135		103		271		504		46.7		41.5		--		--		--		--		--	
05/25-26/2016	E200.7	T					ug/L	238		295		296		663		132		63.3		186		184		24.5		70.4		--	
05/25-26/2016	E200.7	D					ug/L	219		250		208		464		45.3		38.2		--		--		--		--		--	
06/23/2016	E200.7	T					ug/L	255		573		120		716		52.0		36.3		223		223		57.6		70.0		--	
06/23/2016	E200.7	D					ug/L	232		527		113		678		49.9		36.7		213		218		56.8		70.5		--	
07/22/2016	E200.7	T					ug/L	140		517		309		780		78.6		77.0		319		318		335		76.6		335	
07/22/2016	E200.7	D					ug/L	247		680		196		736		69.9		98.0		314		308		242		64.2		242	

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Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5		
							Unit	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result												
Beryllium																														
05/13-16/2016	E200.7	T					ug/L	-		< 0.50	U	< 0.50	U	0.51	J	0.90	J	2.5		< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	-		
05/13-16/2016	E200.7	D					ug/L	< 0.50	U	-		-		-		-		-		-										
05/25-26/2016	E200.7	T					ug/L	< 0.50	U	< 0.50	U	1.6		< 0.50	U	1.5		< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	-		-
05/25-26/2016	E200.7	D					ug/L	< 0.50	U	-		-		-		-		-		-										
06/23/2016	E200.7	T					ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	-		-												
06/23/2016	E200.7	D					ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	-		-												
07/22/2016	E200.7	T					ug/L	< 0.50	U	< 0.50	U	2.1		0.62	J	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	1.4		1.4
07/22/2016	E200.7	D					ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50
Boron																														
05/13-16/2016	E200.7	T					ug/L	818		3050		4730		2020		2870		1800		2730		2710		100		792		-		-
05/13-16/2016	E200.7	D					ug/L	742		2870		4590		1840		2830		1800		-		-		-		-		-		-
05/25-26/2016	E200.7	T					ug/L	1630		3410		4530		2010		3180		1830		2500		2570		103		798		-		-
05/25-26/2016	E200.7	D					ug/L	1630		3250		4230		1900		2930		1800		-		-		-		-		-		-
06/23/2016	E200.7	T					ug/L	1680		3200		2370		1740		2340		1710		3100		3380		157		1960		-		-
06/23/2016	E200.7	D					ug/L	1710		3200		2450		1810		2420		1700		3000		3290		160		1940		-		-
07/22/2016	E200.7	T					ug/L	2480		3860		3840		1940		2450		1830		3410		3450		1650		3220		1650		1650
07/22/2016	E200.7	D					ug/L	1980		3660		3850		1940		2460		1770		3460		3380		1450		3160		1450		1450
Cadmium																														
05/13-16/2016	E200.8	T	2.6		1.4		ug/L	0.090	J	< 0.050	U	0.099	J	< 0.050	U	< 0.050	U	0.12		0.57		0.34		< 0.050	U	< 0.050	U	-		-
05/13-16/2016	E200.8	D	2.6		1.4		ug/L	< 0.050	U	-		-		-		-		-		-										
05/25-26/2016	E200.8	T	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	0.12		< 0.050	U	0.11		< 0.050	U	0.32		-		< 0.050	U	< 0.050	U	-		-
05/25-26/2016	E200.8	D	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	0.095	J	< 0.050	U	< 0.050	U	< 0.050	U	-		-		-		-		-		-
06/23/2016	E200.8	T	2.6		1.4		ug/L	0.061	J	< 0.050	U	0.48		0.39		< 0.050	U	0.064	J	-		-								
06/23/2016	E200.8	D	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	0.50		0.38		< 0.050	U	< 0.050	U	-		-
07/22/2016	E200.8	T	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	< 0.25	U	< 0.10	U	0.060	J	< 0.050	U	0.20		0.20		0.16	J	0.10		0.16	J	0.16
07/22/2016	E200.8	D	2.6		1.4		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	0.15		0.18		< 0.050	U	0.069	J	< 0.050	U	< 0.050
Carbon																														
05/13-16/2016	SM5310B	N	110				mg/L	15.5		0.73	J	2.4		0.54	J	< 0.50	U	0.90	J	1.9		2.2		6.7		1.1		-		-
05/25-26/2016	SM5310B	N	110				mg/L	11.8		1.1		2.3		0.72	J	< 0.50	U	< 0.50	U	1.4		1.5		5.9		1.9		-		-
06/23/2016	SM5310B	N	110				mg/L	4.5		1.7		2.8		0.56	J	0.51	J	< 0.50	U	1.2		1.2		5.8		2.0		-		-
07/22/2016	SM5310B	N	110				mg/L	3.4		1.1		1.2		0.56	J	< 0.50	U	< 0.50	U	1.1		0.94	J	0.84	J	3.7		0.84	J	0.84
Chloride																														
05/13-16/2016	SM4500-Cl-E	N	660		360		mg/L	105		146		60.6		11.7		235		210		246		209		3.4		25.9		-		-
05/25-26/2016	SM4500-Cl-E	N	660		360		mg/L	227		121		62.7		18.3		204		188		183		200		3.0		21.8		-		-
06/23/2016	SM4500-Cl-E	N	660		360		mg/L	274		116		54.9		14.3		199		183		278		295		3.3		78.1		-		-
07/22/2016	SM4500-Cl-E	N	660		360		mg/L	278		119		106		15.2		222		171		287		278		187		215		187		187
Chlorine, Total Residual¹																														
06/23/2016	FIELD	N	0.032		0.018		mg/L	0.04		0.04		0.06		0.05		< 0.01		0.02		0.03		< 0.01		< 0.01		0.05		-		-
07/22/2016	FIELD	N	0.032		0.018		mg/L	0.02		0.02		0.09		< 0.01		< 0.01		< 0.01		< 0.01		< 0.01		< 0.01		0.02		-		-
02/06-21/2017	FIELD	N	0.032		0.018		mg/L	0.00		0.00		-		< 0.003		-		< 0.003		< 0.003		-		-		0.00		-		-

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location		PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5				
							Unit	Result	Qualifier																								
Chromium																																	
05/13-16/2016	E200.8	T					ug/L	2.5		0.97	J	1.8		1.9		2.6		7.3		5.1		6.7		0.81	J	11.4		--					
05/13-16/2016	E200.8	D					ug/L	< 0.50	U	--		--		--		--		--															
05/25-26/2016	E200.8	T					ug/L	2.4		1.2		6.3		< 0.50	U	4.1		0.84	J	9.7		10.1		1.9		12.1		--					
05/25-26/2016	E200.8	D					ug/L	< 0.50	U	--		--		--		--		--															
06/23/2016	E200.8	T					ug/L	0.99	J	< 0.50	U	0.72	J	< 0.50	U	< 0.50	U	< 0.50	U	2.7		3.9		< 0.50	U	40.0		--					
06/23/2016	E200.8	D					ug/L	< 0.50	U	< 0.50	U	0.75	J	< 0.50	U	< 0.50	U	< 0.50	U	2.0		3.9		< 0.50	U	41.4		--					
07/22/2016	E200.8	T					ug/L	0.63	J	1.4		12.1		3.1		1.4		1.5		4.7		4.6		24.4		12.2		24.4					
07/22/2016	E200.8	D					ug/L	< 0.50	U	0.61	J	< 0.50	U	< 0.50	U	1.1		2.1		4.2		4.2		--		11.6		17.7					
Chromium (III)																																	
06/23/2016	CALC	T	0.19		0.10		mg/L	< 0.0025	U	--																							
06/23/2016	CALC	D	0.19		0.10		mg/L	< 0.0025	U	--																							
07/22/2016	CALC	T	0.19		0.10		mg/L	< 0.0025	U	< 0.0025	U	0.012		0.0031	J	< 0.0025	U	0.0071		< 0.0025	U	0.0071											
07/22/2016	CALC	D	0.19		0.10		mg/L	< 0.0025	U																								
Cobalt																																	
05/13-16/2016	E200.7	T					ug/L	10.3		< 5.0	U	6.6	J	< 5.0	U	--																	
05/13-16/2016	E200.7	D					ug/L	7.9	J	< 5.0	U	--		--		--		--		--													
05/25-26/2016	E200.7	T					ug/L	14.3		< 5.0	U	--																					
05/25-26/2016	E200.7	D					ug/L	12.3		< 5.0	U	--		--		--		--		--													
06/23/2016	E200.7	T					ug/L	14.9		< 5.0	U	6.2	J	< 5.0	U	--																	
06/23/2016	E200.7	D					ug/L	14.1		< 5.0	U	5.3	J	< 5.0	U	--																	
07/22/2016	E200.7	T					ug/L	25.5		< 5.0	U	7.1	J	< 5.0	U	5.0	J	< 5.0	U	5.0	J	5.0	J										
07/22/2016	E200.7	D					ug/L	12.8		< 5.0	U																						
Conductivity, field measured																																	
05/13-16/2016	FIELD	N					uS/cm	1380		1552.2		1011		1070		2393		1371.4		972.6		1073.7		124.2		952.6		--					
05/25-26/2016	FIELD	N					uS/cm	1105.8		1760.2		959.9		874		2268.3		1140		949.7		928.6		114.4		366.5		--					
06/23/2016	FIELD	N					uS/cm	1643		1803.5		604.4		1103		2653.4		1452.2		1368		1468		265.9		1352.9		--					
07/22/2016	FIELD	N					uS/cm	1500		1452		762.5		876.0		2151		1251		761.7		761.8		2131		948		--					
Copper																																	
05/13-16/2016	E200.8	T	20		11		ug/L	2.3		2.2		3.3		4.1		5.7		17.0		4.2		2.7		1.8		0.93	J	--					
05/13-16/2016	E200.8	D	20		11		ug/L	< 0.50	U	--		--		--		--		--															
05/25-26/2016	E200.8	T	20		11		ug/L	2.2		0.99	J	10.4		0.81	J	9.2		1.7		3.8		3.6		2.2		2.0		--					
05/25-26/2016	E200.8	D	20		11		ug/L	< 0.50	U	--		--		--		--		--															
06/23/2016	E200.8	T	20		11		ug/L	1.0		< 0.50	U	2.9		1.3		< 0.50	U	0.54	J	--													
06/23/2016	E200.8	D	20		11		ug/L	0.68	J	< 0.50	U	1.5		1.3		< 0.50	U	0.63	J	--													
07/22/2016	E200.8	T	20		11		ug/L	< 0.50	U	2.5		22.6		7.0		3.4		2.6		2.6		1.8		16.1		2.3		16.1					
07/22/2016	E200.8	D	20		11		ug/L	< 0.50	U	< 0.50	U	10.0		< 0.50	U	2.1		3.7		0.90	J	0.98	J	1.5		0.71	J	1.5					
Diesel Range Organics																																	
06/23/2016	SW8015M	N					mg/L	0.11	J	< 0.10	U	0.13	J	< 0.10	U	--																	
Diesel Range Organics (C10-C28)																																	
05/13-16/2016	SW8015M	N					mg/L	< 0.10	U	--																							
05/25-26/2016	SW8015M	N					mg/L	< 0.10	U	0.17	J	< 0.10	U	--																			
07/22/2016	SW8015M	N					mg/L	< 0.10	U																								

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fracton	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location		PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5		
							Unit	Result	Qualifier																						
Dissolved Oxygen, field measured																															
05/13-16/2016	FIELD	N					mg/L	3.68		1.26		1.04		1.77		3.8		3.34		9.17		8.18		10.02		9.15		--			
05/25-26/2016	FIELD	N					mg/L	3.89		1.51		1.59		2.36		1.90		2.90		7.54		7.51		8.58		7.88		--			
06/23/2016	FIELD	N					mg/L	2.74		2.42		6.71		2.57		5.02		3.97		3.24		8.09		6.57		6.71		--			
07/22/2016	FIELD	N					mg/L	1.80		2.47		2.14		1.81		2.32		2.84		8.01		9.41		9.14		7.07		--			
Gasoline (C6-C10)																															
07/22/2016	SW8015M	N					mg/L	0.027	J	0.019	J	0.089		0.030	J	0.026	J	0.064	J	0.021	J	0.025	J	0.027	J	0.045	J	0.027	J		
Gasoline Range Organics																															
06/23/2016	SW8015M	N					mg/L	< 0.016	U	< 0.016	U	0.035	J	< 0.016	U	--															
Hardness, Calcium and Magnesium																															
05/13-16/2016	E200.7	T					ug/L	298000		1180000		570000		547000		1380000		513000		399000		399000		50400		579000		--			
05/25-26/2016	E200.7	T					ug/L	414000		1010000		537000		462000		1330000		--		343000		356000		48300		492000		--			
07/22/2016	E200.7	T					ug/L	541000		878000		506000		512000		1360000		488000		470000		480000		263000		1410000		263000			
Hexavalent Chromium																															
05/13-16/2016	E218.7	N	32		17		ug/L	0.74	J	1.4	J	< 0.010	U	5.3		6.9		0.039		15.3		--									
05/25-26/2016	E218.7	N	32		17		ug/L	< 0.50	U	< 0.10	U	< 0.10	U	< 0.50	U	< 0.10	U	< 0.50	U	9.4		9.2		0.033		12.2		--			
06/23/2016	E218.7	N	32		17		ug/L	< 0.50	U	< 0.010	U	5.0		< 0.10	U	< 0.10	U	0.36	J	2.2		5.4		0.016	J	75.2		--			
06/23/2016	E218.7	D	32		17		ug/L	< 0.50	U	< 0.010	U	0.67		< 0.10	U	< 0.10	U	< 0.20	U	1.7		3.4		< 0.010	U	42.1		--			
07/22/2016	E218.7	N	32		17		ug/L	< 0.50	U	< 0.010	U	0.011	J	< 0.50	U	4.0		6.7		3.6		3.9		17.3		12.0		17.3			
07/22/2016	E218.7	D	32		17		ug/L	< 0.20	U	< 0.010	U	< 0.010	U	7.8		4.3		5.9		4.0		3.7		17.3		12.6		17.3			
Iron																															
05/13-16/2016	E200.7	T					ug/L	60000		4520		3000		22000		16100		43600		183		107		735		49.9		--			
05/13-16/2016	E200.7	D					ug/L	2930		< 20.0	U	16900		--		--		--		--		--									
05/25-26/2016	E200.7	T					ug/L	51000		4110		3550		28000		13800		39800		188		182		769		223		--			
05/25-26/2016	E200.7	D					ug/L	3010		< 20.0	U	< 20.0	U	< 20.0	U	478		24500		--		--		--		--		--			
06/23/2016	E200.7	T					ug/L	52800		2170		< 20.0	U	30000		15500		47700		170		< 20.0	U	< 20.0	U	< 20.0	U	--			
06/23/2016	E200.7	D					ug/L	46800		1870		< 20.0	U	26800		13800		46800		< 20.0	U	--									
07/22/2016	E200.7	T					ug/L	20800		1360		3930		31000		15200		61100		75.9		84.5		2150		430		2150			
07/22/2016	E200.7	D					ug/L	46300		1160		1420		29200		15200		59900		25.4	J	< 20.0	U								
Lead																															
05/13-16/2016	E200.8	T	31		17		ug/L	1.9		1.1		1.9		2.1		4.0		9.4		0.53	J	< 0.50	U	0.55	J	< 0.50	U	--			
05/13-16/2016	E200.8	D	31		17		ug/L	< 0.50	U	--		--		--		--		--													
05/25-26/2016	E200.8	T	31		17		ug/L	1.5		0.66	J	7.9		< 0.50	U	5.9		1.0		0.60	J	0.55	J	0.78	J	0.93	J	--			
05/25-26/2016	E200.8	D	31		17		ug/L	< 0.50	U	--		--		--		--		--													
06/23/2016	E200.8	T	31		17		ug/L	0.56	J	< 0.50	U	0.69	J	< 0.50	U	< 0.50	U	< 0.50	U	--											
06/23/2016	E200.8	D	31		17		ug/L	< 0.50	U	--																					
07/22/2016	E200.8	T	31		17		ug/L	< 0.50	U	1.7		13.7		3.9		1.8		1.4		< 0.50	U	< 0.50	U	6.9		0.92	J	6.9			
07/22/2016	E200.8	D	31		17		ug/L	< 0.50	U	1.3		2.0		< 0.50	U																
Mercury																															
05/13-16/2016	E245.1	T	2.2		1.2		ug/L	< 0.070	U	--																					
05/13-16/2016	E245.1	D	2.2		1.2		ug/L	< 0.090	U	--		--		--		--		--													
05/25-26/2016	E245.1	T	2.2		1.2		ug/L	< 0.070	U	--																					
05/25-26/2016	E245.1	D	2.2		1.2		ug/L	< 0.090	U	--		--		--		--		--													
06/23/2016	E245.1	T	2.2		1.2		ug/L	< 0.070	U	--																					
06/23/2016	E245.1	D	2.2		1.2		ug/L	< 0.090	U	--																					
07/22/2016	E245.1	T	2.2		1.2		ug/L	< 0.070	U	< 0.070	U	0.098	J	< 0.070	U	0.077	J	< 0.070	U	0.077	J										
07/22/2016	E245.1	D	2.2		1.2		ug/L	< 0.090	U																						

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5			
								Unit	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result														
Molybdenum																															
05/13-16/2016	E200.7	T					ug/L	29.9		266		864		86.2		188		< 5.0	U	76.0		87.3		< 5.0	U	91.6		--			
05/13-16/2016	E200.7	D					ug/L	14.8		259		860		83.2		169		< 5.0	U	--		--		--		--		--			
05/25-26/2016	E200.7	T					ug/L	29.2		216		649		98.9		263		< 5.0	U	77.5		87.9		< 5.0	U	87.1		--			
05/25-26/2016	E200.7	D					ug/L	< 5.0	U	229		654		98.5		249		< 5.0	U	--		--		--		--		--			
06/23/2016	E200.7	T					ug/L	25.0		140		199		101		319		< 5.0	U	99.9		121		< 5.0	U	370		--			
06/23/2016	E200.7	D					ug/L	21.3		129		188		95.4		308		< 5.0	U	101		120		< 5.0	U	375		--			
07/22/2016	E200.7	T					ug/L	72.4		60.9		257		106		272		< 5.0	U	124		123		193		442		193			
07/22/2016	E200.7	D					ug/L	15.3		83.5		367		107		270		< 5.0	U	122		120		167		436		167			
Nickel																															
05/13-16/2016	E200.8	T	48		26		ug/L	5.0		2.8		4.6		3.2		3.6		11.0		14.5		11.3		0.94	J	2.8		--			
05/13-16/2016	E200.8	D	48		26		ug/L	3.0		2.0		3.0		1.4		0.96	J	2.3		--		--		--		--		--			
05/25-26/2016	E200.8	T	48		26		ug/L	4.7		1.8		8.2		0.76	J	4.0		2.3		10.6		11.9		1.2		2.3		--			
05/25-26/2016	E200.8	D	48		26		ug/L	3.5		1.2		2.5		< 0.62	U	< 0.62	U	1.6		--		--		--		--		--			
06/23/2016	E200.8	T	48		26		ug/L	4.5		1.3		1.4		< 0.62	U	0.89	J	1.1		15.6		13.6		0.68	J	3.1		--			
06/23/2016	E200.8	D	48		26		ug/L	3.7		1.4		1.6		0.69	J	0.90	J	1.3		14.7		13.8		< 0.62	U	3.5		--			
07/22/2016	E200.8	T	48		26		ug/L	7.8		2.7		15.9		4.9		2.1		2.6		9.4		9.5		11.2		4.4		11.2			
07/22/2016	E200.8	D	48		26		ug/L	3.7		1.2		2.0		0.78	J	1.9		3.5		7.1		7.9		4.9		3.7		4.9			
Nitrogen																															
06/23/2016	CALC	N					mg/L	5.8		1.2		0.79		< 0.12	U	0.70		0.15		1.4		1.7		0.67		69.8		--			
07/22/2016	CALC	N					mg/L	4.0		0.85		< 0.12	U	< 0.12	U	0.50		< 0.12	U	1.3		1.4		1.9		1.5		1.9			
07/22/2016	E351.2	N					mg/L	4.0		0.85		< 0.25	U	< 0.25	U	0.50		< 0.25	U	0.28	J	0.39	J	1.8		1.5		1.8			
Nitrogen, Nitrate-Nitrite																															
06/23/2016	E353.2	N					mg/L	< 0.010	U	< 0.010	U	0.046		< 0.010	U	< 0.010	U	< 0.010	U	1.2		1.2		< 0.010	U	0.62		--			
07/22/2016	E353.2	N					mg/L	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	0.97		0.96		0.18		< 0.010	U	0.18			
Nitrogen, Total Kjeldahl																															
06/23/2016	E351.2	N					mg/L	5.8		1.2		0.74		< 0.25	U	0.70		< 0.25	U	< 0.25	U	0.49	J	0.67		69.2		--			
Oil & Grease, Total Rec																															
05/13-16/2016	E1664B	N	20.0		15.0		mg/L	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	--	
05/25-26/2016	E1664B	N	20.0		15.0		mg/L	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	--	
06/23/2016	E1664B	N	20.0		15.0		mg/L	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	--	
07/22/2016	E1664B	N	20.0		15.0		mg/L	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U	< 1.1	U
Oxidation Reduction Potential, field measured																															
05/13-16/2016	FIELD	N					millivolts	-31.3		-142.6		-131.7		-108.3		-48.7		-64.4		79.0		77.2		22.2		114.4		--			
05/25-26/2016	FIELD	N					millivolts	-106.5		-158.3		-190.2		-170.9		-123.2		-90.9		44.3		71.9		33.5		31.5		--			
06/23/2016	FIELD	N					millivolts	141.5		-193.2		-32.8		-203.5		-162.9		-84.7		-18.8		-24.6		-15.8		0		--			
07/22/2016	FIELD	N					millivolts	-86.6		-173.2		-82.7		-141.1		-100.4		-39.3		28.5		47.6		-32.8		-12.3		--			
pH, field measured																															
05/13-16/2016	FIELD	N	9.0	6.0	9.0	6.0	SU	6.43		7.90		7.56		6.71		6.86		6.74		8.38		8.48		9.63		8.25		--			
05/25-26/2016	FIELD	N	9.0	6.0	9.0	6.0	SU	6.73		7.61		8.01		7.44		7.26		6.95		7.89		7.87		8.98		7.97		--			
06/23/2016	FIELD	N	9.0	6.0	9.0	6.0	SU	6.55		7.58		8.13		7.05		7.07		6.06		6.64		7.72		7.55		7.64		--			
07/22/2016	FIELD	N	9.0	6.0	9.0	6.0	SU	6.56		7.96		7.62		7.08		6.93		6.29		8.27		8.43		8.52		8.38		--			
Phosphorus																															
06/23/2016	E365.1	N					mg/L	0.68		0.53		1.2		0.35		0.14		0.051		< 0.025	U	< 0.025	U	0.027	J	0.19		--			
07/22/2016	E365.1	N					mg/L	0.81		0.30		0.21		0.16		0.14		0.069		0.050		0.056		0.88		0.065		0.88			

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5					
								Unit	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier	Result	Qualifier
Selenium																																	
05/13-16/2016	E200.8	T	14		7.7		ug/L	0.54	J	< 0.50	U	0.76	J	0.64	J	0.84	J	2.1		16.1		19.6		1.9		155		--					
05/13-16/2016	E200.8	D	14		7.7		ug/L	< 0.50	U	< 0.50	U	0.96	J	< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--					
05/25-26/2016	E200.8	T	14		7.7		ug/L	< 0.50	U	< 0.50	U	2.7		< 0.50	U	1.3		< 0.50	U	34.5		34.3		1.5		160		--					
05/25-26/2016	E200.8	D	14		7.7		ug/L	< 0.50	U	< 0.50	U	3.5		< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--					
06/23/2016	E200.8	T	14		7.7		ug/L	< 0.50	U	< 0.50	U	9.5		< 0.50	U	< 0.50	U	< 0.50	U	27.4		29.5		1.1		370		--					
06/23/2016	E200.8	D	14		7.7		ug/L	< 0.50	U	< 0.50	U	9.0		< 0.50	U	< 0.50	U	< 0.50	U	27.5		29.0		1.2		377		--					
07/22/2016	E200.8	T	14		7.7		ug/L	< 0.50	U	0.71	J	12.6		0.83	J	0.57	J	< 0.50	U	41.3		41.6		44.4		242		44.4					
07/22/2016	E200.8	D	14		7.7		ug/L	< 0.50	U	< 0.50	U	1.5		< 0.50	U	< 0.50	U	0.67	J	42.3		41.6		40.2		239		40.2					
Silver																																	
05/13-16/2016	E200.8	T	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	--			
05/25-26/2016	E200.8	T	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	--	
06/23/2016	E200.8	T	5.0		2.7		ug/L	--		< 0.25	U	--		< 0.25	U	< 0.25	U	--		--		--		--		--		--					
06/23/2016	E200.8	D	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	--	
07/22/2016	E200.8	T	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.25	U	< 0.10	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.10	U	< 0.050	U	< 0.10	U	< 0.10	U	U	
07/22/2016	E200.8	D	5.0		2.7		ug/L	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	U	
Sulfate																																	
05/13-16/2016	E300	N					mg/L	85.8		834		154		61.8		1000		374		142		148		8.0		472		--					
05/25-26/2016	E300	N					mg/L	219		655		254		41.8		1020		360		151		152		8.4		411		--					
Temperature, field measured																																	
05/13-16/2016	FIELD	N					C	23.8		19.08		17.4		16.1		20.3		17.61		26.47		27.20		25.15		24.78		--					
05/25-26/2016	FIELD	N					C	26.33		24.20		22.98		21.09		21.84		2533		30.73		31.14		25.01		31.10		--					
06/23/2016	FIELD	N					C	22.76		25.41		20.32		18.56		22.76		25.60		25.31		28.25		25.51		27.38		--					
07/22/2016	FIELD	N					C	23.1		22.0		19.1		17.3		20.9		20.3		32.5		33.8		33.3		33.4		--					
Thallium																																	
05/13-16/2016	E200.8	T	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	0.62	J	1.3		1.1		< 0.50	U	0.82	J	--					
05/13-16/2016	E200.8	D	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--					
05/25-26/2016	E200.8	T	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	0.90	J	1.0		< 0.50	U	0.80	J	--					
05/25-26/2016	E200.8	D	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	--		--		--		--		--					
06/23/2016	E200.8	T	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	0.66	J	< 0.50	U	< 0.50	U	< 0.50	U	1.0		1.3		< 0.50	U	1.5		--					
06/23/2016	E200.8	D	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	0.68	J	< 0.50	U	< 0.50	U	< 0.50	U	0.98	J	1.3		< 0.50	U	1.5		--					
07/22/2016	E200.8	T	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	1.7		< 0.50	U	< 0.50	U	< 0.50	U	1.3		1.3		1.2		1.7		1.2					
07/22/2016	E200.8	D	0.9		0.9		ug/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	1.3		1.3		0.80	J	1.5		0.80	J				
Total Dissolved Solids																																	
05/13-16/2016	SM2540C	D					mg/L	711		1580		622		596		1990		439		702		751		67.0		836		--					
05/25-26/2016	SM2540C	D					mg/L	668		1450		731		556		1870		1010		625		697		125		726		--					
Total Suspended Solids																																	
05/13-16/2016	SM2540D	N	100		30		mg/L	154		10.2		8.1		8.3		146		332		163		15.8		206		2.3		--					
05/25-26/2016	SM2540D	N	100		30		mg/L	62.7		19.4		116		73.2		194		19.6		3.9		5.0		21.3		6.2		--					
06/23/2016	SM2540D	N	100		30		mg/L	27.6		589		528		281		81.8		288		10.5		6.5		4.1		500		--					
07/22/2016	SM2540D	N	100		30		mg/L	53.0		29.5		248		606		174		411		9.4		4.3		390		35.2		390					
Turbidity, field measured																																	
05/13-16/2016	FIELD	N					ntu	218.3		>1000		3190		96		3524.9		443		10.6		8.38		10.3		11.7		--					
05/25-26/2016	FIELD	N					ntu	35		28.3		51.6		10.2		9.56		11.6		8.74		9.7		16.5		20.7		--					
07/22/2016	FIELD	N					ntu	47.8		199.5		66.9		102.1		250.9		81.1		443.9		204.1		20.1		270.3		--					

**Table 1
Summary of Constituents in Lower Ash Pond and Upper Ash Pond
Chesterfield Power Station**

Sample Date	Method	Fraction	Max Effluent Limitations	Min Effluent Limitations	Monthly Avg Limitations	Monthly Min Limitations	Location	PZ-1		PZ-2		PZ-3		PZ-4		PZ-5		PZ-6		S-1		S-2		S-3		S-4		S-5	
							Unit	Result	Qualifier																				
Vanadium																													
05/13-16/2016	E200.7	T					ug/L	< 5.0	U	< 5.0	U	6.9	J	10.0		9.9	J	31.1		22.3		25.3		< 5.0	U	45.8		--	
05/13-16/2016	E200.7	D					ug/L	< 5.0	U	--		--		--		--		--											
05/25-26/2016	E200.7	T					ug/L	< 5.0	U	< 5.0	U	29.2		< 5.0	U	18.0		< 5.0	U	38.0		35.4		< 5.0	U	46.4		--	
05/25-26/2016	E200.7	D					ug/L	< 5.0	U	< 5.0	U	5.4	J	< 5.0	U	< 5.0	U	< 5.0	U	--		--		--		--		--	
06/23/2016	E200.7	T					ug/L	< 5.0	U	< 5.0	U	50.4		< 5.0	U	< 5.0	U	< 5.0	U	34.3		34.8		< 5.0	U	76.6		--	
06/23/2016	E200.7	D					ug/L	< 5.0	U	< 5.0	U	53.8		< 5.0	U	< 5.0	U	< 5.0	U	31.4		34.9		< 5.0	U	76.3		--	
07/22/2016	E200.7	T					ug/L	< 5.0	U	6.1	J	101		24.0		6.5	J	6.4	J	54.4		53.9		83.3		103		83.3	
07/22/2016	E200.7	D					ug/L	< 5.0	U	< 5.0	U	16.8		< 5.0	U	5.0	J	7.4	J	51.8		51.8		58.7		95.5		58.7	
Zinc																													
05/13-16/2016	E200.8	T	190		100		ug/L	29.0		6.5		4.8	J	3.4	J	4.3	J	13.4		15.5		10.5		2.7	J	< 2.5	U	--	
05/13-16/2016	E200.8	D	190		100		ug/L	8.1		< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	3.2	J	--		--		--		--		--	
05/25-26/2016	E200.8	T	190		100		ug/L	21.6		2.5	J	11.0		10.3		6.4		3.0	J	8.2		8.2		7.4		2.5	J	--	
05/25-26/2016	E200.8	D	190		100		ug/L	5.3		< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	--		--		--		--		--	
06/23/2016	E200.8	T	190		100		ug/L	5.2		< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	10.2		< 2.5	U	< 2.5	U	< 2.5	U	--	
06/23/2016	E200.8	D	190		100		ug/L	8.9		< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	< 2.5	U	8.0		3.0	J	< 2.5	U	< 2.5	U	--	
07/22/2016	E200.8	T	190		100		ug/L	4.9	J	3.0	J	20.3		8.4	J	3.4	J	4.3	J	6.0		3.9	J	14.7		3.6	J	14.7	
07/22/2016	E200.8	D	190		100		ug/L	3.1	J	< 2.5	U	12.3		< 2.5	U	< 2.5	U	5.6		< 2.5	U	< 2.5	U	3.0	J	6.4		3.0	J

¹ The original analyses completed 6/23/2016 and 7/22/2016 used untreated samples and a colorimetric method subject to a number of interferences. The results were believed to be false-positives. Additional analyses completed 02/06-21/2017 used samples treated to remove selected interferences as well as a titration method. The results of the 02/06-21/2017 analyses confirmed the earlier 6/23/2016 and 7/22/2016 results were false-positives associated with one or more interferences in the water sample.

Table 2
Centralized Source Water Treatment System Process Chemicals and Polymers
Chesterfield Power Station

Process Category	Type
<u>Oxidation Chemicals</u>	Sodium Hypochlorite Hydrogen Peroxide
<u>Coagulants</u>	Ferric Chloride Ferrous Chloride Adega Chemical WC-500 Sodium Sulfide Alum
<u>Flocculants</u>	Adega AP-210 Adega CP-120
<u>pH Adjustment Chemicals</u>	Sodium Hydroxide Hydrochloric Acid Sulfuric Acid Potassium Hydroxide
<u>Reducing Agents</u>	Ferrous Sulfate Ferric Sulfate

DRAWINGS

C:\Plan Production Data Files\Drawing Data Files\15-206100 - CER Drawings (Dec. 2016)\Active Drawings\1520610001.dwg | Layout: DWG | Modified: SBarry 05/22/2017 4:15 PM | Plotted: SBarry 05/22/2017



AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO ON 6/20/16.
MAP DATA BY: GOOGLE. IMAGERY DATE: 04/05/16



REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
PROJECT						
DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE						
STATION OUTFALLS AND FACILITIES						
PROJECT No. 15-20610			FILE No. 1520610001			
DESIGN	ANG	01/27/17	SCALE		AS SHOWN	
CADD	BPG	01/27/17	DRAWING 1			
CHECK	ANG	01/27/17				
REVIEW	JRD	01/27/17				

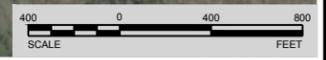


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- NOTES:**
- DISCHARGE FROM LOWER ASH POND MAY BE SENT TO INFLUENT STORAGE TANKS OR THE CSWTS.
 - DISCHARGE FROM UPPER ASH POND MAY BE SENT TO THE LOWER ASH POND, THE INFLUENT STORAGE TANKS, OR THE CSWTS.
 - CSWTS CONFIGURATION SHOWN FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY.

LEGEND
 PUMP



AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO ON 6/20/16.
 MAP DATA BY: GOOGLE. IMAGERY DATE: 04/05/16

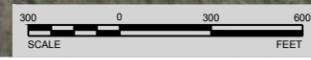
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
PROJECT						
DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE						
CENTRALIZED SOURCE WATER TREATMENT SYSTEM (CSWTS) SITE PLAN						
PROJECT No.		15-20610	FILE No.		1520610002	
DESIGN	ANG	01/27/17	SCALE		AS SHOWN	
CADD	BPG	01/27/17				
CHECK	ANG	01/27/17				
REVIEW	JRD	01/27/17				
DRAWING 2						





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LEGEND
 ▲ **PIEZOMETER**
 ⊗ **SURFACE WATER SAMPLE**

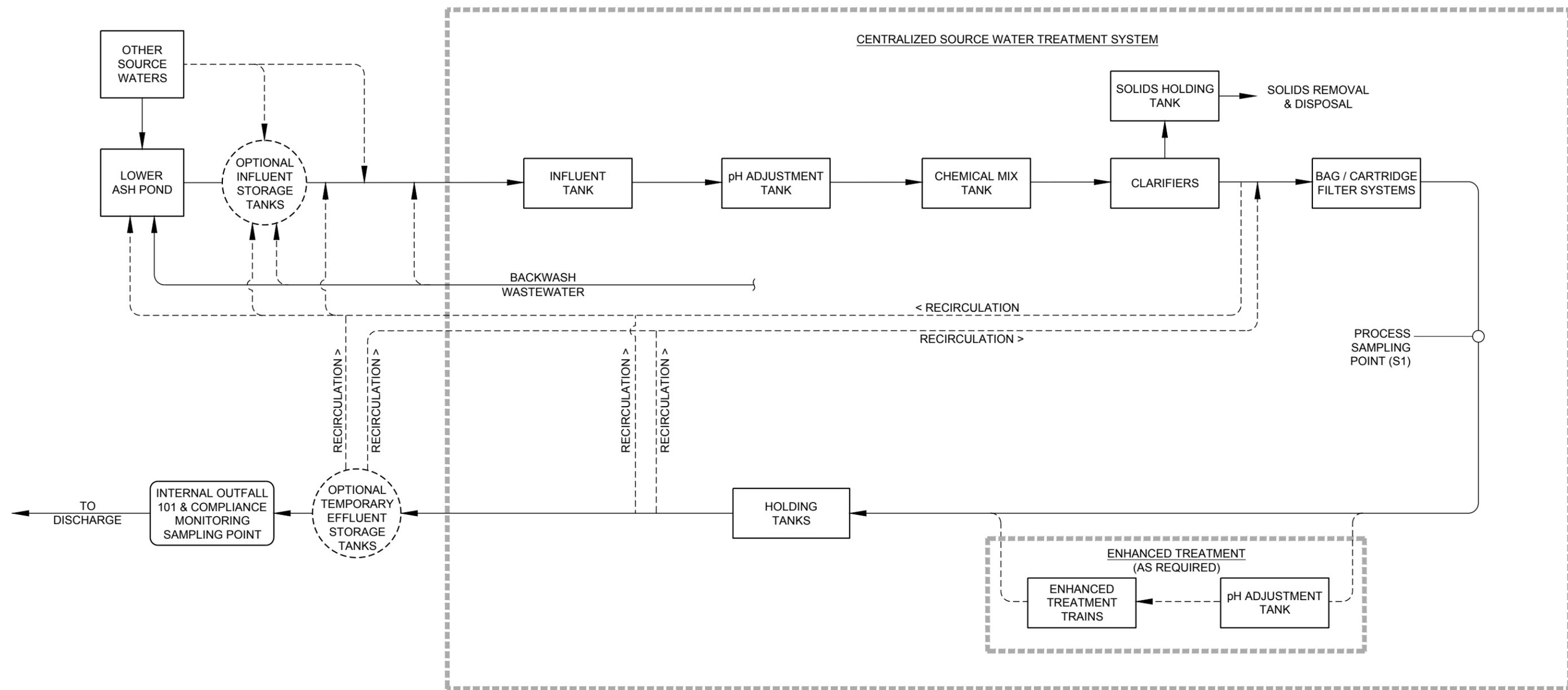


AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO ON 6/20/16.
 MAP DATA BY: GOOGLE. IMAGERY DATE: 04/05/16

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW
PROJECT						
DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE						
SOURCE WATER PIEZOMETER AND DECANT WATER SAMPLE LOCATIONS						
PROJECT No.		15-20610	FILE No.		1520610003	
DESIGN	ANG	01/27/17	SCALE		AS SHOWN	
CADD	BPG	01/27/17	DRAWING 3			
CHECK	ANG	01/27/17				
REVIEW	JRD	01/27/17				



C:\Plan Production Data Files\Drawing Data Files\15-206100 - CER Drawings (Dec. 2018)\Active Drawings\15206100.dwg | Layout: DWG-4 | Modified: KJ.milewicz 04/20/2017 1:48 PM | Plotted: SBoyle 05/22/2017



NOTES

1. CONCEPTUAL CSWTS CONFIGURATION AS DESIGNED BY TREATABILITY STUDIES.
2. BACKWASH WASTEWATER SOURCES MAY INCLUDE FILTER SYSTEMS AND ENHANCED TREATMENT TRAINS.
3. THE NUMBER OF UNITS IN THE FILTER SYSTEMS AND THE VESSELS IN THE ENHANCED TREATMENT TRAINS MAY BE ADJUSTED BASED ON TREATMENT NEEDS.

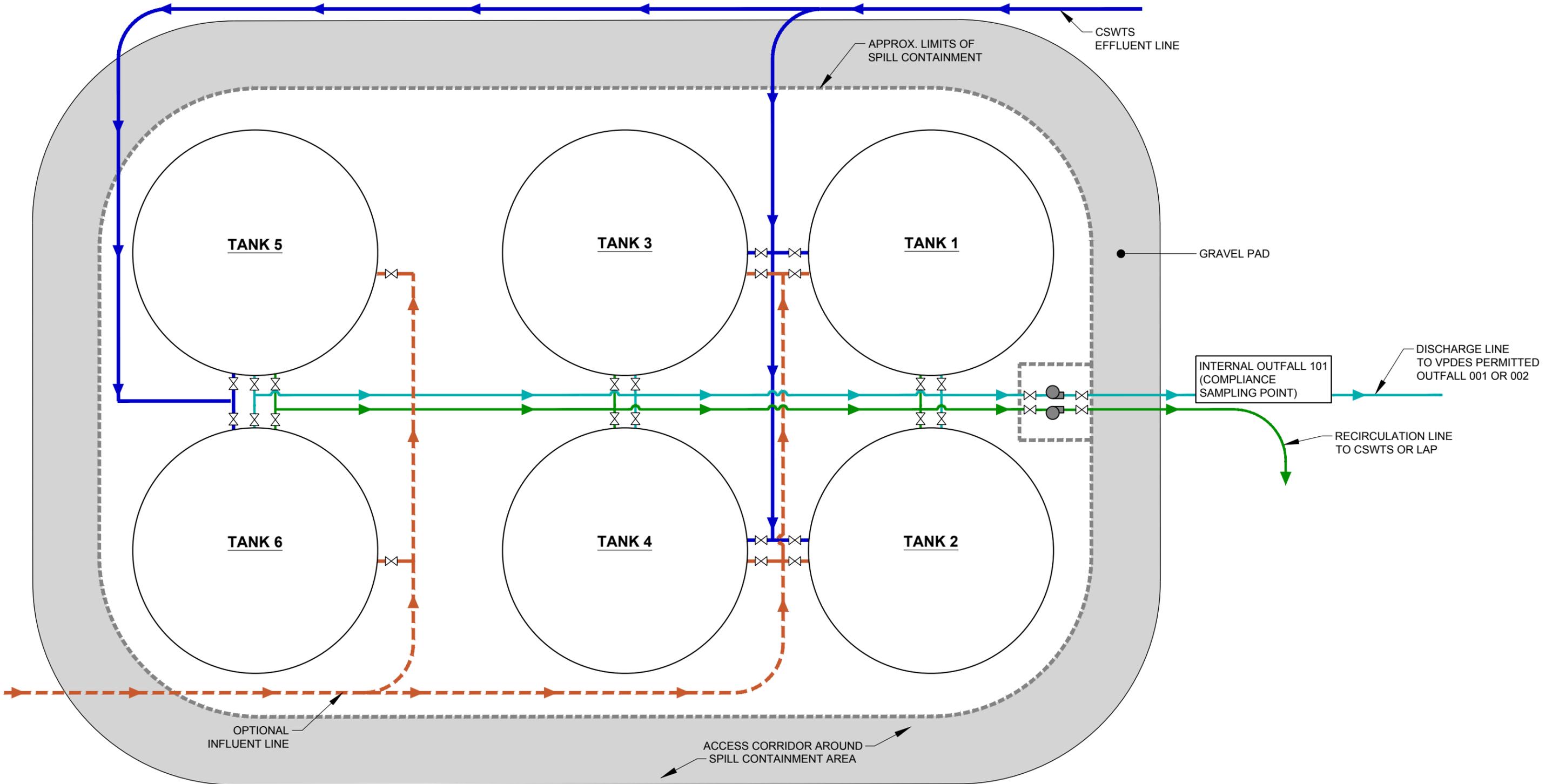
LEGEND

- ▶ FLOW PATH
- - -▶ ALTERNATE FLOW PATH

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVV
PROJECT						
DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE						
PROCESS FLOW DIAGRAM						
PROJECT No.		15-20610	FILE No.		1520610Q04r	
DESIGN	ANG	04/10/17	SCALE		AS SHOWN	
CADD	KLL	04/10/17				
CHECK	ANG	04/10/17				
REVIEW	JRD	04/10/17				
DRAWING 4						



C:\Plan Production Data Files\Drawing Data Files\15-206100 - CER Drawings (Dec. 2018)\Active Drawings\1520610005.dwg | Layout: DWG 5 | Modified: SBarey 05/22/2017 4:10 PM | Plotted: SBarey 05/22/2017



NOTES

1. PIPING SHOWN FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY.
2. SPACE BETWEEN TANKS TO BE GRADED TO DRAIN IN CONTAINMENT AREA.
3. PROCESS SAMPLES MAY BE TAKEN FROM TANKS.
4. TANKS MAY BE FOR INFLUENT OR EFFLUENT.
5. THE NUMBER OF TANKS MAY BE ADJUSTED, AS NEEDED.

LEGEND

- EFFLUENT LINE
- OPTIONAL INFLUENT LINE
- RECIRCULATION LINE
- DISCHARGE LINE TO INTERNAL OUTFALL 101 AND OUTFALL 001 OR 002
- VALVE
- BOOSTER PUMP

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVV
PROJECT: DOMINION CHESTERFIELD POWER STATION CHESTERFIELD COUNTY, VIRGINIA						
TITLE: CONCEPTUAL OPTIONAL INFLUENT / EFFLUENT STORAGE TANK SCHEMATIC						
PROJECT No. 15-20610		FILE No. 1520610005				
DESIGN	ANG	01/27/17	SCALE	AS SHOWN		
CADD	BPG	01/27/17				
CHECK	ANG	01/27/17				
REVIEW	JRD	01/27/17				
			DRAWING 5			



APPENDICES

APPENDIX A
GWTT'S TREATABILITY STUDY

November 29, 2016

Mr. Collin Olie
Project Manager
Remedial Construction Services, LP.
9977 W. Sam Houston Pkwy N.
Suite 100
Houston, Texas 77064-7509

Subject: Ground/Water Treatment & Technology, LLC (GWTT)
Treatability Study Report #SF 6772
RECON's RFP – Dominion Chesterfield Power Station/CCR Pond Remediation

Dear Mr. Olie:

Thank you for allowing Ground/Water Treatment & Technology, LLC (GWTT) the opportunity to provide our services in response to Remedial Construction Services, LP. (RECON) RFP for the Water Treatment Pilot Study to demonstrate the treatability of the water that will be generated through decanting and dewatering operations at the Lower Ash Pond (LAP) located at the Dominion Chesterfield, VA. Power Station.

GWTT is pleased to submit this treatability study report which has been prepared to detail the findings of the bench scale study performed in GWTT's laboratory in Wharton, NJ as well as the on-site pilot on the LAP at the Chesterfield, VA Power Station.

With a clear appreciation for RECON's required scope of services, attached please find our complete Treatability Study Report for your review.

I look forward to additional conversations at your earliest opportunity.

Very truly yours,



Rob Orlando
Chief Engineer
Email: rorlando@gwttllc.com
(Cell) (973) 800 3531

Enclosure Cc: Steve Tappert, Project Manager – GWTT



Water Treatment Pilot Study Report for the Chesterfield Power Station, Chesterfield, VA.

Prepared For

Remedial Construction Services, L.P. (RECON)

9977 West Sam Houston Parkway North, Suite 100

Houston, Texas 77064

November 29, 2016



Table of Contents

Executive Summary.....	2
1.0 Introduction	5
2.0 Sample Collection and Characterization.....	6
2.1. Source Water Collection Procedures	6
2.2. Source Water Characterization.....	6
3.0 Bench Test Results	8
3.1. Introduction	8
3.2. Piezometer PZ-4 Results	8
3.3. Surface Water Results.....	9
3.4. Discussion.....	10
4.0 Pilot Test Results	12
4.1. Pilot Test Procedures	12
4.1.1. Field Activities	12
4.1.2. Influent Sample Results	14
4.1.3. Effluent Sample Results	14
4.2. Discussion.....	14
Appendix A – Tables.....	16
Appendix B – Laboratory Reports.....	17
Appendix C – Pilot Test Layout	18



Executive Summary

Ground/Water Treatment and Technology, LLC (GWTT) performed bench and pilot scale tests on water collected from the Lower Ash Pond at the Chesterfield Power Station. The treatability study included the following tasks:

- Source Water Collection and Characterization
- Lab Bench Scale Treatability Study
- On-Site Pilot Scale System

The purpose of this testing was to determine the optimal treatment scenario for both surface and interstitial (pore) water contained in the Lower Ash Pond (LAP) that would be discharged to the James River during the construction activities provided by RECON, and to provide a cost estimate to construct and operate a full-scale system. RECON has estimated the anticipated volume of water to be approximately 34 million gallons of bulk water and 133 million gallons of interstitial water.

ES.1 Source Water Collection

GWTT personnel mobilized to the Chesterfield site on September 6, 2016 to collect water samples for the laboratory bench scale treatability study. GWTT staff toured the site with RECON staff to locate and identify piezometers suitable for sampling. Site conditions within the boundary of the LAP were difficult (extremely muddy, restricting vehicle access), and not all of the target piezometers were located. However, the following piezometers that are believed to be representative of pore water conditions were identified and sampled:

- PZ-4, located in the southeastern corner of the LAP
- PZ-5, located in ash piles in the east-central portion of the site
- PZ-6, located in the northeastern area of the site

The piezometers were constructed of 1-inch diameter PVC pipe and screen, and were sampled using a peristaltic pump. Each piezometer was purged until the water flowed relatively free of visible sediment, and field parameters such as pH and conductivity were monitored using a flow-through cell until the readings stabilized. Approximately five (5) gallons of water was collected from each piezometer. In addition to the pore water samples, a surface water sample was collected from the southwestern perimeter of the pond west of the truck washing station.

A portion of the water samples were placed in laboratory jars and submitted to Alpha Analytical Laboratories in Westborough, MA for analysis. The samples were analyzed for metals and various wet chemistry parameters. The sample collected from piezometer PZ-4 reported the highest concentrations of metals (primarily arsenic), and was selected for bench test analysis. The surface water reported elevated concentrations of selenium and thallium, and was also selected for bench test analysis.

ES.2 Bench Test Results

The surface water sample and the most contaminated piezometer sample (PZ-4) were tested to determine what treatment processes would be successful in meeting the discharge limitations. Jar tests were conducted using various combinations of chemical reagents to evaluate the effectiveness of various oxidants and coagulants in reducing the concentrations of metals of concern. The selection of reagents tested was based on GWTT's experience with similar wastewaters, including decanting and dewatering wastewaters from CCR ponds.

- The oxidants tested included aeration and sodium hypochlorite.
- The coagulants tested included WC-500 from Adega Chemical and ferric chloride.
- An anionic polymer, AP-210 from Adega Chemical, was used as the flocculent during the study due to the nature of particulates that were formed through the oxidation and coagulation process. The anionic polymer will bind to the cationic metal particulates formed in the chemical precipitation process and increase their mass and allow the particulates to settle quicker than the smaller coagulated particulates without polymer.
- A proprietary combination of adsorption media was evaluated as a metals polishing step.
- Mechanical filtration to 0.5 µm was applied to all test runs.

Results of the bench test indicate that the optimal treatment process for both surface and interstitial waters from the LAP includes the following treatment steps:

- Chemical oxidation of dissolved metals with sodium hypochlorite;
- Chemical coagulation with ferric chloride;
- Chemical flocculation using AP-210 from Adega Chemical;
- Gravity settling of the flocculated particles in a clarifier;
- Mechanical filtration to 0.5 µm using a combination of bag and cartridge filtration, and
- Activated adsorption of dissolved metals using a blend of adsorptive medias.

ES.3 Pilot Test Results

Based on the results of the bench scale tests, GWTT fabricated a pilot test treatment system capable of treating 25 gpm. The treatment system was mobilized to the site starting on October 19, 2016, constructed on a site prepared by RECON, and water treatment began on October 24, 2016.

The pilot system operated for a total of five (5) days from October 24, 2016 through October 28, 2016. Influent and effluent samples were collected each day of the pilot test. Analytical samples were

collected and delivered to Alpha Analytical Laboratories for analysis. Whole Effluent Toxicity (WET) samples were collected and delivered to Coastal Bioanalysts, Inc. for WET testing analysis.

On the first day, the pilot system was operated using the treatment regime shown to be the most effective in meeting the discharge limitations during the bench scale study. This was done in order to prove out the effectiveness of the treatment process from conceptual design and bench scale testing to pilot scale continuous treatment. On subsequent days, various operational parameters (such as pH and contact time in the adsorptive media vessel) were varied to stress the system and evaluate the impact on effluent compliance for the contaminants of concern in the VPDES permit. A total of 52,400 gallons of water were treated during the duration of the five-day pilot test.

The pilot system successfully treated all parameters during the first day of testing, which followed the successful bench test regimen and confirmed the suitability of the treatment train for full-scale operation. Subsequent tests using lower residence times in the adsorptive media were not successful in treating selenium, indicating that the full ten-minute residence time is required to meet the discharge limitations



1.0 Introduction

GWTT has completed bench and pilot scale tests on water samples collected from the Chesterfield Power Station, owned by Dominion and located in Chesterfield, VA. The project was performed for Remedial Construction Services (RECON), a contractor providing ash pond remediation services to Dominion at the Chesterfield plant. Project tasks included the following:

- Sample Collection and Characterization
- Lab Bench Scale Treatability Study
- Pilot Scale Treatability Study

The purpose of this testing was to determine the optimal treatment scenario for both surface and interstitial (pore) water contained in the Lower Ash Pond (LAP) that would be discharged to the James River during the construction activities provided by RECON, and to provide a cost estimate to construct and operate a full-scale system. Dominion has estimated the anticipated volume of water to be approximately 34 million gallons of bulk water and 133 million gallons of interstitial water.

The Virginia Department of Environmental Quality (VADEQ) has issued VPDES Permit No. VA0004146, dated September 23, 2016, which includes discharge limits for proposed Outfall 101, to include wastewaters generated during ash pond closure activities at the Chesterfield site. Permit discharge limitations are listed on Table 1 in Appendix A.



2.0 Sample Collection and Characterization

2.1. Source Water Collection Procedures

GWTT personnel mobilized to the Chesterfield site on September 6, 2016 to collect water samples for the laboratory bench scale treatability study. GWTT staff toured the site with RECON staff to locate and identify piezometers suitable for sampling. Site conditions within the boundary of the LAP were difficult (extremely muddy, restricting vehicle access), and not all of the target piezometers could be located. However, the following piezometers that are believed to be representative of pore water conditions were identified and sampled:

- PZ-4, located in the southeastern corner of the LAP
- PZ-5, located in ash piles in the east-central portion of the site
- PZ-6, located in the northeastern area of the site

The piezometers were constructed of 1-inch diameter PVC pipe and screen, and were sampled using a peristaltic pump. Each piezometer was purged until the water flowed relatively free of visible sediment, and field parameters such as pH and conductivity were monitored using a flow-through cell. After the field parameters stabilized, approximately five (5) gallons of water was collected from each piezometer.

In addition to the pore water samples, a surface water sample was collected from the southwestern perimeter of the pond west of the truck washing station. The sample was collected by submerging Teflon tubing in the pond and extracting water using a peristaltic pump, using the same field parameter monitoring techniques as the piezometer samples.

All samples were transported to the GWTT office in Wharton, NJ. Samples for analysis were placed in clean laboratory bottles and taken to the Mahwah, NJ service center of Alpha Analytical Laboratories (Alpha), and were subsequently transported by Alpha personnel to their laboratory in Westborough, MA and logged in with a request for expedited turnaround time.

2.2. Source Water Characterization

The results of the chemical analysis are presented in Table 2, located in Appendix A. The full laboratory report is included in Appendix B.

The highlighted values in Table 2 identify concentrations exceeding the discharge limitations for that parameter. The surface water sample reported elevated concentrations of selenium and thallium

exceeding the discharge limitations. Piezometers PZ-4 and PZ-5 reported concentrations of arsenic exceeding the discharge limitation, and piezometer PZ-6 reported copper at a concentration exceeding the discharge limitation.



3.0 Bench Test Results

3.1. Introduction

The source water samples were brought back to GWTT's treatability lab in Wharton, NJ for bench testing to reduce the concentrations of contaminants of concern, primarily total metals, to meet effluent discharge criteria. The surface water sample and the most contaminated piezometer sample (PZ-4) were tested to determine what treatment processes would be successful in meeting the discharge limitations. Jar tests were conducted using chemical reagents to evaluate the effectiveness of various oxidants and coagulants in reducing the concentrations of metals of concern.

To meet the stringent discharge requirements for metals, GWTT evaluated treatment technologies with the capability of removing dissolved metals, including the following:

- Proprietary Blend of Activated Media
- Anaerobic Fixed-Film Biological Reactors
- Physical-Chemical Precipitation
- Zero Valent Iron Technology

Based on our experience with similar waste streams at CCR sites, GWTT selected chemical precipitation coupled with activated media adsorption as the preferred approach. A similar system has been operating for almost a year at a CCR site in the Southeast, and has been successfully treating a high volume of wastewater to stringent effluent requirements.

GWTT tested the interstitial source water sample with the highest concentrations of metals and the surface water sample to determine the optimum treatment process to meet the permit limitations. Results tables for the bench test are found in Appendix A, and full laboratory reports are found in Appendix B.

3.2. Piezometer PZ-4 Results

The interstitial source water from Piezometer PZ-4 was tested primarily due to the concentration of arsenic, which exceeded the effluent limitation by more than an order of magnitude (2,963 micrograms per liter ($\mu\text{g/L}$) in the sample vs. the effluent limitation of 240 $\mu\text{g/L}$). The first bench test compared the effectiveness of both the oxidizer and the coagulant used. The concentration of iron in the PZ-4 sample

was also elevated, which would create an increased volume of sludge even though iron does not have an effluent limitation in the discharge permit. Reagents tested included the following:

- The two oxidants tested were aeration and sodium hypochlorite
- The two coagulants tested were WC-500 from Atega Chemical and ferric chloride
- An anionic polymer, AP-210 from Atega Chemical, was used as the flocculent during the study due to the nature of particulates that were formed through the oxidation and coagulation process. The anionic polymer will bind to the cationic metal particulates formed in the chemical precipitation process and increase their mass and allow the particulates to settle quicker than the smaller coagulated particulates without polymer.

The sample results are summarized in Table 3. Arsenic concentrations were reported below the discharge criteria for all samples. The reagents used for each sample run are shown below.

- **PZ4-OCL-FE** – Sodium Hypochlorite, Ferric Chloride, AP-210, Mechanical Filtration to 0.5 μm
- **PZ4-AIR-FE** – Aeration, Ferric Chloride, AP-210, Mechanical Filtration to 0.5 μm
- **PZ4-OCL-WC**– Sodium Hypochlorite, WC-500, AP-210, Mechanical Filtration to 0.5 μm
- **PZ4-AIR-WC** – Aeration, WC-500, AP-210, Mechanical Filtration to 0.5 μm

The sample results indicate that the concentration of all metals were reduced in the bench scale test run using sodium hypochlorite and aeration for Piezometer PZ-4. The concentration of nickel, however, was an order of magnitude higher in both samples treated with ferric chloride than in the influent sample.

The aeration process during the jar testing elevated the pH of the AIR samples to an average of 8.6. The samples that were oxidized with sodium hypochlorite stayed close to the ambient pH of 7.3. A subsequent test was performed using sodium hypochlorite as the oxidizer and increasing the pH of the samples using sodium hydroxide to an average pH of 8.6. The sample results are shown in Table 4, and the reagents used for each sample run are shown below.

- **8.5-PZ4-OCL-WC** – Sodium Hypochlorite, Sodium Hydroxide pH Adjustment to 8.5, WC-500, AP-210, Mechanical Filtration to 0.5 μm
- **8.5-PZ4-OCL-FE**– Sodium Hypochlorite, Sodium Hydroxide pH Adjustment to 8.5, Ferric Chloride, AP-210, Mechanical Filtration to 0.5 μm

The sample results show that while the arsenic concentrations were below the discharge criteria, the sample results were an order of magnitude greater than the prior test, so the increase in pH using sodium hydroxide did not provide additional benefit to the treatment process and was not tested further.

3.3. Surface Water Results

Since the contaminants of concern differed from the surface water and the previously tested PZ-4, the same testing was performed to determine which oxidant would be more beneficial to treat the selenium and the thallium in the surface water. The sample results are shown in Table 5, using the same sample nomenclature.

- The two oxidants tested were aeration and sodium hypochlorite
- The two coagulants tested were WC-500 from Adega Chemical and ferric chloride

The sample results indicate that the concentration of thallium was reduced in the bench scale test run using sodium hypochlorite as the oxidizer, but the concentrations did not decrease using aeration as the oxidizer. The concentration of selenium, however, was not reduced with the use of any oxidant and coagulant combination. This was expected, because selenium is difficult to reduce through chemical precipitation and additional treatment is required to reduce the concentration of selenium below the discharge limitation.

Subsequent testing using a blend of activated adsorptive media to reduce the selenium concentration was performed. Ferrous sulfate was added prior to the adsorptive media for two of the test runs to determine if a reducing agent was necessary to facilitate selenium adsorption. The results are shown in Table 6 (test runs using activated adsorption blended media is identified by the acronym “AA” in the sample identification). The treatment processes used for each of the jar testing runs are summarized below:

- **SW-JAR 1-AA** – Sodium Hypochlorite, Ferric Chloride, Mechanical Filtration to 0.5 µm, Activated Adsorption Blended Media
- **SW-JAR 2-AA** - Mechanical Filtration to 0.5 µm, Activated Adsorption Blended Media
- **SW-JAR 3-AA** – Ferrous Sulfate Reduction, Mechanical Filtration to 0.5 µm, Activated Adsorption Blended Media
- **SW-JAR 4-AA** – Ferrous Sulfate Reduction, Sodium Hypochlorite, Ferric Chloride, Mechanical Filtration to 0.5 µm, Activated Adsorption Blended Media

3.4. Discussion

The sample labeled SW-JAR1-AA was treated using a chemical precipitation process that is identical to the treatment processes of both Piezometer PZ-4 (PZ4-OCL-FE) and surface water (SW-OCL-FE) samples.

- The sample result for PZ4-OCL-FE did not include the final treatment step involving the activated adsorption media, but was still successful in reducing all of the metals below the discharge permit limits.
- The sample result for SW-OCL-FE did not include the final treatment step involving the activated adsorption media, but was successful in reducing all of the metals below the discharge permit limits with the exception of selenium.
- The surface water sample was further treated in SW-JAR1-AA through the use of activated adsorption media, which was successful in reducing the total selenium to below the discharge criteria.

It has been determined that the optimal treatment process for all waters contained in the LAP consists of the following unit operations:

1. Chemical oxidation of dissolved metals with sodium hypochlorite
2. Chemical coagulation with ferric chloride,
3. Chemical flocculation using AP-210 from Adega Chemical,

4. Gravity settling of the flocculated particles in a clarifier,
5. Mechanical filtration to 0.5 um using a combination of bag and cartridge filtration, and
6. Activated adsorption of dissolved metals using a blend of adsorptive medias.



4.0 Pilot Test Results

GWTT has constructed many treatment systems on a design-build basis using bench-scale treatability testing to generate the full-scale design. For this project, a pilot test was also conducted to further refine the treatment scheme based on results of a test in a real-world setting.

Based on the results of the bench scale tests, GWTT fabricated a pilot test treatment system capable of treating 25 gallons per minute (GPM). The treatment system was mobilized to the site starting on October 19, 2016, constructed on a site prepared by RECON, and water treatment began on October 24, 2016. A layout drawing of the system is provided in Appendix C.

The system included a chemical injection trailer which contained chemical feed pumps and chemical storage, but is not shown on the equipment layout drawing. The chemical injection trailer was placed adjacent to the chemical mix tank at the head of the pilot system.

The surface water was pumped approximately 600 feet from the LAP to the pilot system through the use of 5 HP submersible pumps on a floating pontoon. The pump was placed at a depth several feet above the ash to minimize the volume of solids that may have been drawn into the system.

4.1. Pilot Test Procedures

4.1.1. Field Activities

The pilot system operated for a total of five (5) days from October 24, 2016 through October 28, 2016. Influent and effluent samples were collected each day of the pilot test. Analytical samples were collected and delivered to Alpha Analytical Laboratories for analysis. Whole Effluent Toxicity (WET) samples were collected and delivered to Coastal Bioanalysts, Inc. for WET testing analysis.

On the first day the pilot system was operated using the treatment regime demonstrated during the bench scale study to be effective in meeting the discharge limitations, in order to prove out the effectiveness of the treatment process from conceptual design and bench scale testing to pilot scale continuous treatment. On subsequent days, various operational parameters were varied to stress the system and evaluate the impact on effluent compliance for the contaminants of concern in the VPDES permit.

Flow and pH data were locally displayed and recorded daily for the influent and effluent of the pilot system. The effluent pH was controlled by a metering pump that introduced sodium hydroxide to the

effluent holding tank to maintain a pH of approximately 7.5 prior to discharging to frac tanks for storage prior to final disposal. The influent flow was set to 25 gpm for the duration of the pilot testing.

Daily activities for the pilot test are summarized below:

Day 1 Operations (No Sampling) – October 24, 2016

The first day of treatment introduced a total of 4,400 gallons to the system before commencing discharge on the following day, October 25, 2016. The system was calibrated for flow (25 gpm) with regards to chemical dosages determined from the bench scale testing, as well as for contact time through the activated adsorption media to ensure the effluent concentrations would be reduced to below discharge limitations.

Day 2 Operations (First Sampling Day) – October 25, 2016

The pilot system was operated in accordance to the parameters of the bench scale testing with regards to chemical additions, contact time through the media (10 minutes Empty Bed Contact Time (EBCT)), and maximum flow rate of the pilot system.

A total of 10,000 gallons was treated during the first full day of discharge. Influent and effluent samples were collected and analyzed for the contaminants of concern. The first of three samples for Chronic WET was also collected.

Day 3 Operations (Second Sampling Day)– October 26, 2016

The pilot system was operated in accordance to the parameters of the bench scale testing with regards to chemical additions and maximum flow rate of the pilot system. The contact time of the media was reduced in half (5 minutes EBCT) to provide the first of three different stress tests on the pilot system.

A total of 12,000 gallons was treated during the second day of discharge. Influent and effluent samples were collected and analyzed for the contaminants of concern on the draft permit. The second of three samples for Chronic WET was also collected. The sample for Acute WET testing was also collected.

Day 4 Operations (Third Sampling Day) – October 27, 2016

The pilot system was operated in accordance to the parameters of the bench scale testing with regards to chemical additions and maximum flow rate of the pilot system. The contact time of the media was increased from the first stress test but still below the recommended contact time (7.5 minutes EBCT) to provide the second of three different stress tests on the pilot system.

A total of 12,000 gallons was treated during the third day of discharge. Influent and effluent samples were collected and analyzed for the contaminants of concern on the draft permit. No WET testing samples were collected during this day.

Day 5 Operations (Fourth Sampling Day) – October 28, 2016

The pilot system was operated in accordance to the parameters of the bench scale testing with regards to contact time and maximum flow rate of the pilot system. The pH setpoint of the water entering the adsorptive media was increased from 5.5 to 7.5 (ambient pH following the clarifier) to see what effect the pH would have on media performance to provide the final stress test on the pilot system.

A total of 14,000 gallons was treated during the final day of discharge. Influent and effluent samples were collected and analyzed for the contaminants of concern on the draft permit. The third sample for Chronic WET was also collected.

4.1.2. Influent Sample Results

Daily influent sampling was performed to characterize the influent water quality entering the system and to track changes in the influent waste stream entering the pilot system. The compiled data is shown below in Table 7, and the full laboratory reports are provided in Appendix B. The influent data reported elevated concentrations of selenium and TSS. The arsenic concentrations did not exceed the discharge limitation in the permit. This was consistent with source water collected for the bench scale testing. Hexavalent chromium (Cr^{6+}) was reported at concentrations below the discharge limitation for all samples collected.

4.1.3. Effluent Sample Results

Effluent sample results are provided in Table 8, and the full laboratory reports are provided in Appendix B. Selenium was reported non-detect on the first day of sampling.

4.2. Discussion

The pilot system was successful in treating all of the contaminants of concern on the VPDES discharge permit for the sample collected on Day 2 (the first day of sampling), when the system was operated in accordance with the bench test regimen that generated optimum results. The data obtained through the pilot study as well as the bench scale treatability confirmed that the conceptual design of the treatment plant unit operations would meet all discharge criteria for the Chesterfield site.

The remaining days of the pilot study were used to provide a risk matrix to the effluent compliance of the full-scale treatment system with regards to selenium treatability. Results for samples collected on Day 3 of the pilot study showed that a decrease in the EBCT (5 minutes EBCT) of the activated adsorption media did not reduce the selenium concentration below the permit limitation. Results for samples collected on Day 4 of the pilot study reported a seventy percent reduction in the concentration of selenium at 7.5 minutes EBCT. The contact time that was shown to be effective in the bench scale and pilot scale was 10 minutes. Results for samples collected on Day 5 of the pilot study demonstrated the effect of elevated pH on selenium treatability; the selenium concentration was not reduced at a pH of 7.2–7.5 through the activated adsorption media.

WET testing samples were collected on Day 2, Day 3, and Day 5 for the Chronic testing and Day 3 for the Acute testing. The purpose of collecting WET testing samples during the risk analysis is to determine if there were any contaminants of concern which would cause the WET results to be non-compliant. The increased selenium in the effluent stream was the only contaminant of concern which was above effluent discharge criteria, so water quality data was also analyzed in the WET testing to see if any of those parameters would be affected during the risk analysis.

Overall, the WET testing showed passing results for both test species: *Ceriodaphnia dubia* (*C. dubia*) and *Pimephales promelas* (*P. promelas*). The water quality data obtained in the WET testing showed acceptable levels for temperature, pH and dissolved oxygen throughout the testing. Effluent residual chlorine, measured using field testing kits in the field by GWTT, was undetected for every sample collected during the pilot testing.

Using the data that was generated in the bench scale testing, along with previous water treatment experience with maintaining compliance with VPDES permits for ash pond closures, it was determined

that the pilot system could be scaled up to a full scale continuous treatment system to guarantee compliance with the effluent VPDES permit.

Appendix A – Tables

Table 1
VPDES Permit Discharge Limitations - Outfall 101

Parameter	Units	Daily Maximum	Monthly Average
Flow	MGD	5	NL
pH	Standard Units (S.U)	6.0 to 9.0	NA
Total Suspended Solids (TSS)	mg/L	88	30
Total Residual Chlorine (TRC)	µg/L	32	18
Oil and Grease	mg/L	20	15
Total Organic Carbon (TOC)	mg/L	110	NA
Total Copper (Cu)	µg/L	20	11
Total Dissolved Chromium VI (Cr ⁶)	µg/L	32	17
Total Chloride (Cl)	mg/L	660	360
Total Nickel (Ni)	µg/L	48	26
Total Silver (Ag)	µg/L	5	2.7
Total Thallium (Th)	µg/L	0.9	0.9
Total Zinc (Zn)	µg/L	190	100
Total Cadmium (Cd)	µg/L	2.6	1.4
Total Arsenic (As)	µg/L	440	240
Total Chromium III (Cr ³⁺)	µg/L	190	100
Total Lead (Pb)	µg/L	31	17
Total Mercury (Hg)	µg/L	2.2	1.2
Total Selenium	µg/L	14	7.7
Total Antimony (Sb)	µg/L	1,300	1,300
WET Limitation, <i>Ceriodaphnia</i>	NOAC	100% (min)	
WET Limitation, <i>Ceriodaphnia</i>	TU _c	2.85	
WET Limitation, <i>Pimephales</i>	NOAC	100% (min)	
WET Limitation, <i>Pimephales</i>	TU _c	2.85	

Table 2
Source Water Results

PARAMETER	VPDES Permit Limitations	INFLUENT CHARACTERIZATION RESULTS 09/09/16									
		SURFACE	Q	PZ-4	Q	PZ-5	Q	PZ-6	Q	RL	MDL
<i>Total Metals (mg/L)</i>											
Antimony	1.3	0.0139		0.0009	J	0.0005	J	0.001	J	0.004	0.0002
Arsenic	0.24	0.0855		2.963		0.9581		0.0934		0.001	0.0003
Cadmium	0.0014	0.0002	J	ND		ND		0.0001	J	0.001	0.0001
Chromium	0.017	0.0031		0.0009	J	0.00096	J	0.0058		0.001	0.0003
Copper	0.011	0.0033		0.0024		0.0018		0.0156		0.001	0.0001
Iron	NL	0.057		25.2		12.8		65.8		0.05	0.02
Lead	0.017	0.0002	J	0.0012		0.0012		0.0067		0.001	0.0002
Mercury	0.0012	ND		ND		ND		ND		0.0002	0.00006
Nickel	0.026	0.0112		0.002		0.0018		0.0103		0.001	0.0001
Selenium	0.0077	0.0765		ND		ND		0.0037	J	0.005	0.001
Silver	0.0027	ND		ND		ND		ND		0.0004	0.0001
Thallium	0.0009	0.0011		0.0001	J	0.0001	J	0.0005	J	0.001	0.0001
Zinc	0.1	0.0049	J	0.0039	J	ND		0.0346		0.005	0.0026

Table 4
Piezometer PZ-4 Sodium Hypochlorite and Sodium Hydroxide Bench Scale Testing

PARAMETER	BENCH SCALE RESULTS 09/13/16 AND 09/14/16							
	PZ-4 INFLUENT	Q	8.5-PZ4- OCL-WC	Q	8.5-PZ4- OCL-FE	Q	RL	MDL
<i>Total Metals (mg/L)</i>								
Antimony	0.0009	J	0.0004	J	0.0004	J	0.004	0.0002
Arsenic	2.963		0.0103		0.0925		0.001	0.0003
Cadmium	ND		ND		ND		0.001	0.0001
Chromium	0.0009	J	0.0003	J	ND		0.001	0.0003
Copper	0.0024		0.0021		0.0005		0.001	0.0001
Iron	25.2		ND		ND		0.05	0.02
Lead	0.0012		ND		ND		0.001	0.0002
Mercury	ND		0.0001	J	0.00007	J	0.0002	0.00006
Nickel	0.002		0.0049		0.0014		0.001	0.0001
Selenium	ND		0.001	J	ND		0.005	0.001

Table 7
Influent Surface Water Characterization During Pilot Test

PARAMETER	INFLUENT SAMPLE RESULTS									
	INFLUENT 102516	Q	INFLUENT 102616	Q	INFLUENT 102716	Q	INFLUENT 102816	Q	RL	MDL
<i>Total Metals (mg/L)</i>										
Aluminum	--		0.836		--		1.515		0.01	0.0033
Antimony	0.01		0.0124		0.0089		0.0052		0.004	0.0004
Arsenic	0.0683		0.0788		0.077		0.0508		0.001	0.0002
Barium	--		--		--		0.2281		0.001	0.0002
Beryllium	--		0.0004	J	--		0.0006	j	0.001	0.0001
Boron	--		1.68		--		1.19		0.03	0.002
Cadmium	0.0002	J	0.0004	J	0.0003	J	0.0002	j	0.001	0.0001
Calcium	--		95.3		--		84.8		0.1	0.035
Chromium	0.0053		0.0079		0.0122		0.0054		0.001	0.0002
Cobalt	--		0.003	J	--		0.0041		0.02	0.002
Copper	0.0062		0.0046		0.0068		0.0053		0.001	0.0004
Iron	0.581		0.29		0.614		0.532		0.05	0.009
Lead	0.0035		0.0014		0.0035		0.0029		0.001	0.0003
Magnesium	--		9.75		--		9.42		0.1	0.015
Mercury	ND		ND		ND		ND		0.0002	0.00006
Molybdenum	--		0.108		--		0.0592		0.05	0.004
Nickel	0.0164		0.0134		0.0131		0.0116		0.002	0.0006
Potassium	--		7.75		--		7.49		2.5	0.237
Selenium	0.0359		0.0391		0.042		0.0229		0.005	0.0017
Silver	ND		ND		ND		ND		0.0004	0.0003
Sodium	--		55.7		--		77.4		2	0.12
Thallium	0.0008	J	0.0008	J	0.0008	J	0.0008	J	0.001	0.0001
Vanadium	--		0.056		--		0.0399		0.01	0.002
Zinc	0.0419		0.0113		0.0167		0.0139		0.01	0.0034
<i>Dissolved Metals (mg/L)</i>										
	INFLUENT 102516	Q	INFLUENT 102616	Q	INFLUENT 102716	Q	INFLUENT 102816	Q	RL	MDL
Aluminum	--		0.208		--		0.1375		0.01	0.0033
Antimony	0.0135		0.0117		0.011		0.0074		0.004	0.0004
Arsenic	0.0631		0.0686		0.0677		0.043		0.001	0.0002
Barium	--		--		--		0.193		0.001	0.0002
Beryllium	--		ND		--		ND		0.001	0.0001
Boron	--		1.7		--		1.45		0.03	0.002
Cadmium	0.0003	J	0.0003	J	0.0002	J	0.0003	J	0.001	0.0001
Calcium	--		95.3		--		91		0.1	0.035
Chromium	0.0035		0.0069		0.0102		0.0043		0.001	0.0002
Cobalt	--		0.002	J	--		0.003	J	0.02	0.002
Copper	0.0008	J	0.0008	J	0.0004	J	0.0009	J	0.002	0.0004
Iron	0.02	J	ND		ND		ND		0.05	0.01
Lead	ND		ND		ND		ND		0.001	0.0003
Magnesium	--		9.6		--		9.6		0.1	0.015
Mercury	ND		ND		ND		ND		0.0002	0.00006
Molybdenum	--		0.12		--		0.07		0.05	0.004
Nickel	0.0106		0.0138		0.01		0.0102		0.002	0.0006
Potassium	--		8		--		7.4		2.5	0.237
Selenium	0.0358		0.0379		0.0391		0.021		0.005	0.0017
Silver	ND		ND		ND		ND		0.0004	0.0003
Sodium	--		59		--		80		2	0.12
Thallium	0.0007	J	0.0007	J	0.0006	J	0.0007	J	0.001	0.0001
Vanadium	--		0.054		--		0.036		0.01	0.002
Zinc	0.0359		0.007	J	0.0069	J	0.0096	J	0.01	0.0034
<i>General Chemistry (mg/L)</i>										
	INFLUENT 102516	Q	INFLUENT 102616	Q	INFLUENT 102716	Q	INFLUENT 102816	Q	RL	MDL
Solids, Total Suspended	47		40		48		61		1	NA
Chloride	140		150		150		170		10	2
Nitrogen, Ammonia	0.778		0.193		0.826		0.67		0.075	0.028
Total Organic Carbon	1.3		1.84		1.89		2.29		1	0.228
Oil and Grease, Hem-Grav	ND		ND		ND		ND		4	4
Chromium, Hexavalent	0.003	J	0.007	J	0.01		ND		0.01	0.003

**Table 8
Pilot Test Effluent Results**

PARAMETER	EFFLUENT SAMPLE RESULTS									
	EFFLUENT 102516	Q	EFFLUENT 102616	Q	EFFLUENT 102716	Q	EFFLUENT 102816	Q	RL	MDL
<i>Total Metals (mg/L)</i>										
Aluminum	--		0.3582		--		0.2748		0.01	0.0033
Antimony	0.0005	J	0.0005	J	ND		ND		0.004	0.0004
Arsenic	0.0016		ND		0.0003	J	0.0003	J	0.001	0.0002
Barium	--		--		--		0.0014		0.001	0.0002
Beryllium	--		ND		--		ND		0.001	0.0001
Boron	--		0.44		--		1.61		0.03	0.002
Cadmium	ND		ND		ND		ND		0.001	0.0001
Calcium	--		79.2		--		80.1		0.1	0.035
Chromium	0.0004	J	0.0005	J	0.0009	J	0.002		0.001	0.0002
Cobalt	--		ND	J	--		0.0002	J	0.02	0.002
Copper	0.0004	J	ND		ND		ND		0.001	0.0004
Iron	0.1		ND		0.011	J	0.019	J	0.05	0.009
Lead	ND		ND		ND		ND		0.001	0.0003
Magnesium	--		5.78		--		8.29		0.1	0.015
Mercury	ND		ND		ND		ND		0.0002	0.00006
Molybdenum	--		ND		--		0.0008	J	0.05	0.004
Nickel	ND		0.0009	J	0.001	J	0.0011	J	0.002	0.0006
Potassium	--		6.92		--		7.2		2.5	0.237
Selenium	ND		0.0439		0.0125		0.0208		0.005	0.0017
Silver	ND		ND		ND		ND		0.0004	0.0003
Sodium	--		54		--		89.4		2	0.12
Thallium	ND		ND		ND		ND		0.001	0.0001
Vanadium	--		ND		--		ND		0.01	0.002
Zinc	0.025		ND		0.0039	J	ND		0.01	0.0034
<i>Dissolved Metals (mg/L)</i>										
Zinc	0.0114		ND		0.0051	J	ND		0.01	0.0034
Vanadium	--		ND		--		ND		0.01	0.002
Thallium	ND		ND		ND		ND		0.001	0.0001
Sodium	--		56		--		96		2	0.12
Silver	ND		ND		ND		ND		0.0004	0.0003
Selenium	ND		0.0431		0.0088		0.0203		0.005	0.0017
Potassium	--		7.3		--		7.5		2.5	0.237
Nickel	ND		0.0006	J	0.0025		ND		0.002	0.0006
Molybdenum	--		ND		--		ND		0.05	0.004
Mercury	0.00032		ND		ND		ND		0.0002	0.00006
Magnesium	--		5.6		--		8.6		0.1	0.015
Lead	ND		ND		ND		ND		0.001	0.0003
Iron	ND		ND		ND		ND		0.05	0.01
Copper	ND		ND		ND		ND		0.002	0.0004
Cobalt	--		ND	J	--		ND		0.02	0.002
Chromium	0.0004	J	0.0002	J	0.0011		0.0022		0.001	0.0002
Calcium	--		84		--		87		0.1	0.035
Cadmium	ND		ND		ND		ND		0.001	0.0001
Boron	--		0.44		--		1.62		0.03	0.002
Beryllium	--		ND		--		ND		0.001	0.0001
Barium	--		--		--		ND		0.001	0.0002
Arsenic	0.0013		0.0003	J	0.0004	J	0.0003	J	0.001	0.0002
Antimony	0.0009	J	0.0005	J	0.0007	J	0.0005	J	0.004	0.0004
Aluminum	--		0.3908		--		0.2708		0.01	0.0033
<i>General Chemistry (mg/L)</i>										
Solids, Total Suspended	6		ND		ND		ND		1	NA
Chloride	97		160		190		210		10	2
Nitrogen, Ammonia	0.402		0.805		0.149		0.419		0.075	0.028
Total Organic Carbon	0.99		0.53		0.56		0.53		1	0.228
Oil and Grease, Hem-Grav	ND		ND		ND		ND		4	4
Chromium, Hexavalent	ND		ND		ND		0.004	J	0.01	0.003
TPH - DRO					72.9				200	42
TPH - GRO					ND				50	3

Appendix B – Laboratory Reports



ANALYTICAL REPORT

Lab Number:	L1628405
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	Not Specified
Report Date:	09/13/16

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Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:09131613:55

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1628405-01	SURFACE	WATER	VA	09/09/16 11:30	09/09/16
L1628405-02	PZ-4	WATER	VA	09/09/16 11:35	09/09/16
L1628405-03	PZ-5	WATER	VA	09/09/16 11:40	09/09/16
L1628405-04	PZ-6	WATER	VA	09/09/16 11:45	09/09/16

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Metals

The WG930852-4 MS recovery for arsenic (2%), performed on L1628405-02, does not apply because the sample concentration is greater than four times the spike amount added.

The WG930854-4 MS recovery for iron (30%), performed on L1628405-02, does not apply because the sample concentration is greater than four times the spike amount added.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 09/13/16

METALS

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

SAMPLE RESULTS

Lab ID: L1628405-01
 Client ID: SURFACE
 Sample Location: VA
 Matrix: Water

Date Collected: 09/09/16 11:30
 Date Received: 09/09/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0139		mg/l	0.0040	0.0002	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0855		mg/l	0.0010	0.0003	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Cadmium, Total	0.0002	J	mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Chromium, Total	0.0031		mg/l	0.0010	0.0003	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Copper, Total	0.0033		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Iron, Total	0.057		mg/l	0.050	0.020	1	09/12/16 08:15	09/12/16 15:03	EPA 3005A	19,200.7	AB
Lead, Total	0.0002	J	mg/l	0.0010	0.0002	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/12/16 09:47	09/12/16 17:22	EPA 245.1	3,245.1	EA
Nickel, Total	0.0112		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Selenium, Total	0.0765		mg/l	0.0050	0.0010	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Thallium, Total	0.0011		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT
Zinc, Total	0.0049	J	mg/l	0.0050	0.0026	1	09/12/16 08:15	09/12/16 14:29	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

SAMPLE RESULTS

Lab ID: L1628405-02
 Client ID: PZ-4
 Sample Location: VA
 Matrix: Water

Date Collected: 09/09/16 11:35
 Date Received: 09/09/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0009	J	mg/l	0.0040	0.0002	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Arsenic, Total	2.963		mg/l	0.0100	0.0030	10	09/12/16 08:15	09/12/16 13:23	EPA 3005A	3,200.8	TT
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Chromium, Total	0.0009	J	mg/l	0.0010	0.0003	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Copper, Total	0.0024		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Iron, Total	25.2		mg/l	0.050	0.020	1	09/12/16 08:15	09/12/16 14:14	EPA 3005A	19,200.7	PS
Lead, Total	0.0012		mg/l	0.0010	0.0002	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/12/16 09:47	09/12/16 17:41	EPA 245.1	3,245.1	EA
Nickel, Total	0.0020		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Thallium, Total	0.0001	J	mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT
Zinc, Total	0.0039	J	mg/l	0.0050	0.0026	1	09/12/16 08:15	09/12/16 12:12	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

SAMPLE RESULTS

Lab ID: L1628405-03
 Client ID: PZ-5
 Sample Location: VA
 Matrix: Water

Date Collected: 09/09/16 11:40
 Date Received: 09/09/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0005	J	mg/l	0.0040	0.0002	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Arsenic, Total	0.9581		mg/l	0.0100	0.0030	10	09/12/16 08:15	09/12/16 14:55	EPA 3005A	3,200.8	TT
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Chromium, Total	0.00096	J	mg/l	0.00100	0.00025	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Copper, Total	0.0018		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Iron, Total	12.8		mg/l	0.050	0.020	1	09/12/16 08:15	09/12/16 15:07	EPA 3005A	19,200.7	AB
Lead, Total	0.0012		mg/l	0.0010	0.0002	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/12/16 09:47	09/12/16 17:43	EPA 245.1	3,245.1	EA
Nickel, Total	0.0018		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Thallium, Total	0.0001	J	mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT
Zinc, Total	ND		mg/l	0.0050	0.0026	1	09/12/16 08:15	09/12/16 14:32	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

SAMPLE RESULTS

Lab ID: L1628405-04
 Client ID: PZ-6
 Sample Location: VA
 Matrix: Water

Date Collected: 09/09/16 11:45
 Date Received: 09/09/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0010	J	mg/l	0.0040	0.0002	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0934		mg/l	0.0010	0.0003	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Cadmium, Total	0.0001	J	mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Chromium, Total	0.0058		mg/l	0.0010	0.0003	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Copper, Total	0.0156		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Iron, Total	65.8		mg/l	0.050	0.020	1	09/12/16 08:15	09/12/16 15:12	EPA 3005A	19,200.7	AB
Lead, Total	0.0067		mg/l	0.0010	0.0002	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/12/16 09:47	09/12/16 17:45	EPA 245.1	3,245.1	EA
Nickel, Total	0.0103		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Selenium, Total	0.0037	J	mg/l	0.0050	0.0010	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Thallium, Total	0.0005	J	mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT
Zinc, Total	0.0346		mg/l	0.0050	0.0026	1	09/12/16 08:15	09/12/16 14:35	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-04 Batch: WG930852-1										
Antimony, Total	0.0006	J	mg/l	0.0040	0.0002	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Arsenic, Total	ND		mg/l	0.0010	0.0003	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Chromium, Total	ND		mg/l	0.0010	0.0003	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Copper, Total	ND		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Nickel, Total	ND		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Thallium, Total	ND		mg/l	0.0010	0.0001	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT
Zinc, Total	ND		mg/l	0.0050	0.0026	1	09/12/16 08:15	09/12/16 12:01	3,200.8	TT

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-04 Batch: WG930854-1										
Iron, Total	ND		mg/l	0.050	0.020	1	09/12/16 08:15	09/12/16 13:58	19,200.7	PS

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-04 Batch: WG930895-1										
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/12/16 09:47	09/12/16 17:19	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1



Serial_No:09131613:55

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-04 Batch: WG930852-2								
Antimony, Total	100		-		85-115	-		
Arsenic, Total	102		-		85-115	-		
Cadmium, Total	115		-		85-115	-		
Chromium, Total	96		-		85-115	-		
Copper, Total	105		-		85-115	-		
Lead, Total	102		-		85-115	-		
Nickel, Total	104		-		85-115	-		
Selenium, Total	100		-		85-115	-		
Silver, Total	104		-		85-115	-		
Thallium, Total	102		-		85-115	-		
Zinc, Total	109		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-04 Batch: WG930854-2								
Iron, Total	91		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-04 Batch: WG930895-2								
Mercury, Total	98		-		85-115	-		



Serial_No:09131613:55

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG930852-4 QC Sample: L1628405-02 Client ID: PZ-4												
Antimony, Total	0.0009J	0.5	0.5128	102		-	-		70-130	-		20
Arsenic, Total	2.963	0.12	2.808	2	Q	-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.0540	106		-	-		70-130	-		20
Chromium, Total	0.0009J	0.2	0.1708	85		-	-		70-130	-		20
Copper, Total	0.0024	0.25	0.2263	90		-	-		70-130	-		20
Lead, Total	0.0012	0.51	0.4790	94		-	-		70-130	-		20
Nickel, Total	0.0020	0.5	0.4464	89		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.0971	81		-	-		70-130	-		20
Silver, Total	ND	0.05	0.0479	96		-	-		70-130	-		20
Thallium, Total	0.0001J	0.12	0.1074	90		-	-		70-130	-		20
Zinc, Total	0.0039J	0.5	0.4721	94		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG930854-4 QC Sample: L1628405-02 Client ID: PZ-4												
Iron, Total	25.2	1	25.5	30	Q	-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG930895-4 QC Sample: L1628405-01 Client ID: SURFACE												
Mercury, Total	ND	0.005	0.00374	75		-	-		70-130	-		20



Serial_No:09131613:55

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG930852-3 QC Sample: L1628405-02 Client ID: PZ-4						
Antimony, Total	0.0009J	0.0024J	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.0009J	0.0012	mg/l	NC		20
Copper, Total	0.0024	0.0027	mg/l	10		20
Lead, Total	0.0012	0.0012	mg/l	4		20
Nickel, Total	0.0020	0.0020	mg/l	3		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Thallium, Total	0.0001J	0.0001J	mg/l	NC		20
Zinc, Total	0.0039J	0.0031J	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG930852-3 QC Sample: L1628405-02 Client ID: PZ-4						
Arsenic, Total	2.963	3.121	mg/l	5		20
Total Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG930854-3 QC Sample: L1628405-02 Client ID: PZ-4						
Iron, Total	25.2	25.2	mg/l	0		20
Total Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG930895-3 QC Sample: L1628405-01 Client ID: SURFACE						
Mercury, Total	ND	ND	mg/l	NC		20



Project Name: DOMINION CHESTERFIELD**Lab Number:** L1628405**Project Number:** Not Specified**Report Date:** 09/13/16**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

Cooler Information Custody Seal**Cooler**

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1628405-01A	Plastic 500ml HNO3 preserved	A	<2	5.7	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1628405-02A	Plastic 500ml HNO3 preserved	A	<2	5.7	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1628405-03A	Plastic 500ml HNO3 preserved	A	<2	5.7	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1628405-04A	Plastic 500ml HNO3 preserved	A	<2	5.7	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1628405
Report Date: 09/13/16

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 NEW JERSEY CHAIN OF CUSTODY Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193	Service Centers Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105	Page 1	Date Rec'd in Lab 9/9/16	ALPHA Job # 21628405	
		of 1			
Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288	Project Information Project Name: Dominion Chesterfield Project Location: VA		Deliverables <input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQiS (1 File) <input type="checkbox"/> EQiS (4 File) <input type="checkbox"/> Other	Billing Information <input checked="" type="checkbox"/> Same as Client Info PO #	
Client Information Client: GWTT Address: 627 Mt Hope Wharton, NJ 07885 Phone: 973-983-0901 Fax: 973-983-0903 Email: rorlando@gwttllc.com	Project # (Use Project name as Project #) <input checked="" type="checkbox"/> Project Manager: Rob Orlando ALPHAQuote #: Turn-Around Time: Standard <input type="checkbox"/> Due Date: Tuesday 9/13/16 Rush (only if pre approved) <input checked="" type="checkbox"/> # of Days: 2	Regulatory Requirement <input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input checked="" type="checkbox"/> Other VADEQ	Site Information Is this site impacted by Petroleum? Yes <input type="checkbox"/> Petroleum Product:		
These samples have been previously analyzed by Alpha <input type="checkbox"/>		ANALYSIS		Sample Filtration <input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)	
For EPH, selection is REQUIRED: <input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2	For VOC, selection is REQUIRED: <input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011	Other project specific requirements/comments: Please specify Metals or TAL. Ag, Ti, Zn, Sb, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se			TOTAL METALS
ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date Time	Sample Matrix	Sampler's Initials	
28405-0 02 03 04	SURFACE PZ-4 PZ-5 PZ-6	9/9/16 1130 9/9/16 1135 9/9/16 1140 9/9/16 1145	WW WW WW WW	JEC JEC JEC JEC	X X X X
Preservative Code: A = None B = HCl C = HNO ₃ D = H ₂ SO ₄ E = NaOH F = MeOH G = NaHSO ₄ H = Na ₂ S ₂ O ₃ K/E = Zn Ac/NaOH O = Other	Container Code P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle	Westboro: Certification No: MA935 Mansfield: Certification No: MA015	Container Type P Preservative C	Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)	
Requisitioned By: [Signature]		Date/Time: 9/9/2016 1200	Received By: [Signature]		Date/Time: 9/9/16 12:00
Requisitioned By: [Signature]		Date/Time: 9-9-16 1800	Received By: [Signature]		Date/Time: 9-9-16 1800
Requisitioned By: [Signature]		Date/Time: 9-9-16 2330	Received By: [Signature]		Date/Time: 9/9/16 2330



ANALYTICAL REPORT

Lab Number:	L1629023
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	Not Specified
Report Date:	09/19/16

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:09191613:42

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1629023-01	85-PZ4-OCLWC	WATER	VA	09/14/16 10:30	09/14/16
L1629023-02	PZ4-OCL FE	WATER	VA	09/13/16 17:00	09/14/16
L1629023-03	PZ4-AIR FE	WATER	VA	09/13/16 17:00	09/14/16
L1629023-04	PZ4-OCL WC	WATER	VA	09/13/16 17:00	09/14/16
L1629023-05	PZ4-AIR WC	WATER	VA	09/13/16 17:00	09/14/16
L1629023-06	85-PZ4-OCL FE	WATER	VA	09/14/16 10:30	09/14/16
L1629023-07	SW-OCL-WC	WATER	VA	09/14/16 13:00	09/14/16
L1629023-08	SW-AIR-FE	WATER	VA	09/14/16 13:00	09/14/16
L1629023-09	SW-AIR-WC	WATER	VA	09/14/16 13:00	09/14/16
L1629023-10	SW-OCL-FE	WATER	VA	09/14/16 13:00	09/14/16

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Amita Naik

Title: Technical Director/Representative

Date: 09/19/16

METALS

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-01
 Client ID: 85-PZ4-OCLWC
 Sample Location: VA
 Matrix: Water

Date Collected: 09/14/16 10:30
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0004	J	mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0103		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Chromium, Total	0.0003	J	mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Copper, Total	0.0021		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 19:51	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Mercury, Total	0.00010	J	mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 17:56	EPA 245.1	3,245.1	EA
Nickel, Total	0.0049		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Selenium, Total	0.0010	J	mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Silver, Total	0.0001	J	mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM
Zinc, Total	0.0026	J	mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 14:56	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-02
 Client ID: PZ4-OCL FE
 Sample Location: VA
 Matrix: Water

Date Collected: 09/13/16 17:00
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0004	J	mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0009	J	mg/l	0.0040	0.0003	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Cadmium, Total	0.0001	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Chromium, Total	0.0039		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Copper, Total	0.0033		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:08	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Mercury, Total	0.00031		mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:02	EPA 245.1	3,245.1	EA
Nickel, Total	0.0273		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Silver, Total	0.0013		mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM
Zinc, Total	0.0084		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 14:59	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-03
 Client ID: PZ4-AIR FE
 Sample Location: VA
 Matrix: Water

Date Collected: 09/13/16 17:00
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0003	J	mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0008	J	mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Cadmium, Total	0.0001	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Copper, Total	0.0034		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Iron, Total	0.041	J	mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:25	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:04	EPA 245.1	3,245.1	EA
Nickel, Total	0.0274		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Silver, Total	0.0001	J	mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM
Zinc, Total	0.0113		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 15:02	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-04
 Client ID: PZ4-OCL WC
 Sample Location: VA
 Matrix: Water

Date Collected: 09/13/16 17:00
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0038		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Chromium, Total	0.0004	J	mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Copper, Total	0.0008	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:29	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Mercury, Total	0.00012	J	mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:05	EPA 245.1	3,245.1	EA
Nickel, Total	0.0027		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 15:05	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-05
 Client ID: PZ4-AIR WC
 Sample Location: VA
 Matrix: Water

Date Collected: 09/13/16 17:00
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0005	J	mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0052		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Copper, Total	0.0006	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:34	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:07	EPA 245.1	3,245.1	EA
Nickel, Total	0.0031		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 15:15	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-06
 Client ID: 85-PZ4-OCL FE
 Sample Location: VA
 Matrix: Water

Date Collected: 09/14/16 10:30
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0004	J	mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0925		mg/l	0.0040	0.0003	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Copper, Total	0.0005	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:38	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Mercury, Total	0.00007	J	mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:13	EPA 245.1	3,245.1	EA
Nickel, Total	0.0014		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 15:18	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-07
 Client ID: SW-OCL-WC
 Sample Location: VA
 Matrix: Water

Date Collected: 09/14/16 13:00
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0129		mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0038		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Cadmium, Total	0.0001	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Chromium, Total	0.0033		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Copper, Total	0.0012		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:42	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:15	EPA 245.1	3,245.1	EA
Nickel, Total	0.0090		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Selenium, Total	0.0679		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Thallium, Total	0.0001	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 15:21	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-08
 Client ID: SW-AIR-FE
 Sample Location: VA
 Matrix: Water

Date Collected: 09/14/16 13:00
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0083		mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0008	J	mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Cadmium, Total	0.0002	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Chromium, Total	0.0014		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Copper, Total	0.0038		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:46	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:17	EPA 245.1	3,245.1	EA
Nickel, Total	0.0135		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Selenium, Total	0.0074		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Thallium, Total	0.0010		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM
Zinc, Total	0.0062		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 15:24	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-09
 Client ID: SW-AIR-WC
 Sample Location: VA
 Matrix: Water

Date Collected: 09/14/16 13:00
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0132		mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0031		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Cadmium, Total	0.0002	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Chromium, Total	0.0026		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Copper, Total	0.0017		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:51	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:19	EPA 245.1	3,245.1	EA
Nickel, Total	0.0093		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Selenium, Total	0.0385		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Thallium, Total	0.0011		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 15:27	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

SAMPLE RESULTS

Lab ID: L1629023-10
 Client ID: SW-OCL-FE
 Sample Location: VA
 Matrix: Water

Date Collected: 09/14/16 13:00
 Date Received: 09/14/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0080		mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0009	J	mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Cadmium, Total	0.0002	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Chromium, Total	0.0049		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Copper, Total	0.0026		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 20:55	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 18:20	EPA 245.1	3,245.1	EA
Nickel, Total	0.0155		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Selenium, Total	0.0713		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Silver, Total	0.0003	J	mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Thallium, Total	0.0001	J	mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM
Zinc, Total	0.0073		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 15:30	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-10 Batch: WG932613-1										
Antimony, Total	0.0003	J	mg/l	0.0040	0.0002	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Arsenic, Total	ND		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Chromium, Total	ND		mg/l	0.0010	0.0003	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Copper, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Lead, Total	ND		mg/l	0.0010	0.0002	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Nickel, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Selenium, Total	ND		mg/l	0.0050	0.0010	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0001	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	0.0001	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM
Zinc, Total	ND		mg/l	0.0050	0.0026	1	09/16/16 10:30	09/16/16 14:45	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-10 Batch: WG932616-1										
Iron, Total	ND		mg/l	0.050	0.020	1	09/16/16 15:16	09/16/16 19:34	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-10 Batch: WG932632-1										
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/16/16 09:30	09/16/16 17:52	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1



Serial_No:09191613:42

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-10 Batch: WG932613-2								
Antimony, Total	96		-		85-115	-		
Arsenic, Total	104		-		85-115	-		
Cadmium, Total	115		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	108		-		85-115	-		
Lead, Total	102		-		85-115	-		
Nickel, Total	108		-		85-115	-		
Selenium, Total	106		-		85-115	-		
Silver, Total	110		-		85-115	-		
Thallium, Total	100		-		85-115	-		
Zinc, Total	109		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-10 Batch: WG932616-2								
Iron, Total	87		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-10 Batch: WG932632-2								
Mercury, Total	97		-		85-115	-		



Serial_No:09191613:42

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-10			QC Batch ID: WG932613-4			QC Sample: L1629023-01			Client ID: 85-PZ4-OCLWC			
Antimony, Total	0.0004J	0.5	0.5779	116	-	-	-	-	70-130	-	-	20
Arsenic, Total	0.0103	0.12	0.1398	108	-	-	-	-	70-130	-	-	20
Cadmium, Total	ND	0.051	0.0625	122	-	-	-	-	70-130	-	-	20
Chromium, Total	0.0003J	0.2	0.2011	100	-	-	-	-	70-130	-	-	20
Copper, Total	0.0021	0.25	0.2618	104	-	-	-	-	70-130	-	-	20
Lead, Total	ND	0.51	0.5260	103	-	-	-	-	70-130	-	-	20
Nickel, Total	0.0049	0.5	0.5306	105	-	-	-	-	70-130	-	-	20
Selenium, Total	0.0010J	0.12	0.1347	112	-	-	-	-	70-130	-	-	20
Silver, Total	0.0001J	0.05	0.0533	107	-	-	-	-	70-130	-	-	20
Thallium, Total	ND	0.12	0.1155	96	-	-	-	-	70-130	-	-	20
Zinc, Total	0.0026J	0.5	0.5324	106	-	-	-	-	70-130	-	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-10			QC Batch ID: WG932616-4			QC Sample: L1629023-01			Client ID: 85-PZ4-OCLWC			
Iron, Total	ND	1	0.889	89	-	-	-	-	75-125	-	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-10			QC Batch ID: WG932632-4			QC Sample: L1629023-01			Client ID: 85-PZ4-OCLWC			
Mercury, Total	0.00010J	0.005	0.00484	97	-	-	-	-	70-130	-	-	20



Serial_No:09191613:42

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-10 QC Batch ID: WG932613-3 QC Sample: L1629023-01 Client ID: 85-PZ4-OCLWC						
Antimony, Total	0.0004J	0.0007J	mg/l	NC		20
Arsenic, Total	0.0103	0.0103	mg/l	0		20
Cadmium, Total	ND	0.0001J	mg/l	NC		20
Chromium, Total	0.0003J	0.0004J	mg/l	NC		20
Copper, Total	0.0021	0.0020	mg/l	4		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	0.0049	0.0046	mg/l	6		20
Selenium, Total	0.0010J	ND	mg/l	NC		20
Silver, Total	0.0001J	0.0001J	mg/l	NC		20
Thallium, Total	ND	0.0001J	mg/l	NC		20
Zinc, Total	0.0026J	0.0026J	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-10 QC Batch ID: WG932616-3 QC Sample: L1629023-01 Client ID: 85-PZ4-OCLWC						
Iron, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-10 QC Batch ID: WG932632-3 QC Sample: L1629023-01 Client ID: 85-PZ4-OCLWC						
Mercury, Total	0.00010J	0.00008J	mg/l	NC		20



Project Name: DOMINION CHESTERFIELD

Project Number: Not Specified

Lab Number: L1629023

Report Date: 09/19/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629023-01A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1629023-02A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1629023-03A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1629023-04A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1629023-05A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1629023-06A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1629023-07A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD**Project Number:** Not Specified**Lab Number:** L1629023**Report Date:** 09/19/16**Container Information**

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629023-08A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1629023-09A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1629023-10A	Plastic 250ml HNO3 preserved	A	<2	2.1	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1629023
Report Date: 09/19/16

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 <p>NEW JERSEY CHAIN OF CUSTODY</p> <p>Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-8220 FAX: 508-898-9193</p> <p>Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288</p>	<p>Service Centers</p> <p>Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105</p>	<p>Page <u>1</u> of <u>1</u></p>	<p>Date Rec'd in Lab <u>9/14/16</u></p>	<p>ALPHA Job # <u>61629023</u></p>		
	<p>Project Information</p> <p>Project Name: <u>DOMINION CHESTERFIELD</u></p> <p>Project Location: <u>VA</u></p>	<p>Deliverables:</p> <p><input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> EQUIS (4 File) <input type="checkbox"/> Other</p>	<p>Billing Information</p> <p><input checked="" type="checkbox"/> Same as Client Info PO #</p>			
<p>Client Information</p> <p>Client: <u>GWTT</u></p> <p>Address: <u>627 Mt. Hope Pl</u> <u>1, Shelton VT 05785</u></p> <p>Phone: <u>923-983-0901</u></p> <p>Fax: <u>923-983-0901</u></p> <p>Email:</p>	<p>Project #</p> <p>(Use Project name as Project #) <input checked="" type="checkbox"/></p> <p>Project Manager: <u>Roe Deland</u></p> <p>ALPHAQuote #:</p> <p>Turn-Around Time</p> <p>Standard <input type="checkbox"/> Due Date: Rush (only if pre approved) <input type="checkbox"/> # of Days:</p>	<p>Regulatory Requirement</p> <p><input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input type="checkbox"/> Other</p>	<p>Site Information</p> <p>Is this site impacted by Petroleum? Yes <input type="checkbox"/></p> <p>Petroleum Product:</p>			
<p>These samples have been previously analyzed by Alpha <input type="checkbox"/></p>	<p>ANALYSIS</p>	<p>Sample Filtration</p> <p><input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)</p>				
<p>For EPH, selection is REQUIRED:</p> <p><input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2</p>	<p>For VOC, selection is REQUIRED:</p> <p><input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011</p>	<p>Other project specific requirements/comments:</p> <p><u>METALS by 204.8</u> <u>Please specify Metals or TAL.</u> <u>Se, Ag, Ti, Zn, Sb, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni,</u></p>	<p>TOTAL METALS</p>			
<p>ALPHA Lab ID (Lab Use Only)</p>	<p>Sample ID</p>	<p>Collection</p> <p>Date Time</p>	<p>Sample Matrix</p>	<p>Sampler's Initials</p>	<p>ANALYSIS</p>	<p>Sample Specific Comments</p>
<u>29023</u>	<u>85-P24-OCL WC</u>	<u>9/14/16 1030</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>02</u>	<u>P24-OCL FE</u>	<u>9/13/16 1700</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>03</u>	<u>P24-AIR FE</u>	<u>9/13/16 1700</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>04</u>	<u>P24-OCL WC</u>	<u>9/13/16 1700</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>05</u>	<u>P24-AIR WC</u>	<u>9/13/16 1700</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>06</u>	<u>85-P24-OCL FE</u>	<u>9/14/16 1030</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>07</u>	<u>SW-OCL-WC</u>	<u>9/14/16 1300</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>08</u>	<u>SW-AIR-FE</u>	<u>9/14/16 1300</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>09</u>	<u>SW-AIR-WC</u>	<u>9/14/16 1300</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<u>10</u>	<u>SW-OCL-FE</u>	<u>9/14/16 1300</u>	<u>WW</u>	<u>RMD</u>	<u>X</u>	
<p>Preservative Code: A = None B = HCl C = HNO₃ D = H₂SO₄ E = NaOH F = MeOH G = NaHSO₄ H = Na₂S₂O₃ K/E = Zn Ac/NaOH O = Other</p>	<p>Container Code P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle</p>	<p>Westboro: Certification No: MA935 Mansfield: Certification No: MA015</p>	<p>Container Type <u>P</u></p> <p>Preservative <u>C</u></p>	<p>Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)</p>		
<p>Relinquished By: <u>[Signature]</u></p>	<p>Date/Time: <u>9/14/16 1830</u></p>	<p>Received By: <u>[Signature]</u></p>	<p>Date/Time: <u>9/14/16 18:30</u></p>			
<p>Relinquished By: <u>[Signature]</u></p>	<p>Date/Time: <u>9/14/16 1840</u></p>	<p>Received By: <u>[Signature]</u></p>	<p>Date/Time: <u>9/14/16 1850</u></p>			
<p>Relinquished By: <u>[Signature]</u></p>	<p>Date/Time: <u>9/14/16 2355</u></p>	<p>Received By: <u>[Signature]</u></p>	<p>Date/Time: <u>9/14/16 2355</u></p>			



ANALYTICAL REPORT

Lab Number:	L1630097
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	Not Specified
Report Date:	09/26/16

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:09261616:29

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1630097-01	AIR-OCL-FE-SW	WATER	VA	09/22/16 12:00	09/22/16
L1630097-02	AIR-OCL-WC-SW	WATER	VA	09/22/16 12:30	09/22/16

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Metals

The WG935162-3 Laboratory Duplicate RPD, performed on L1630097-02, is above the acceptance criteria for copper (29%); however, the sample and duplicate results are less than five times the reporting limit. Therefore, the RPD is valid.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Michelle M. Morris

Title: Technical Director/Representative

Date: 09/26/16

METALS

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

SAMPLE RESULTS

Lab ID: L1630097-01
 Client ID: AIR-OCL-FE-SW
 Sample Location: VA
 Matrix: Water

Date Collected: 09/22/16 12:00
 Date Received: 09/22/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.00640		mg/l	0.00200	0.00042	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00099	J	mg/l	0.00100	0.00016	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00023	J	mg/l	0.00100	0.00005	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Chromium, Total	0.00521		mg/l	0.00100	0.00017	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Copper, Total	0.00347		mg/l	0.00100	0.00038	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Iron, Total	ND		mg/l	0.050	0.020	1	09/23/16 12:20	09/24/16 01:34	EPA 3005A	19,200.7	FB
Lead, Total	0.00080	J	mg/l	0.00100	0.00034	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/23/16 10:34	09/23/16 18:21	EPA 245.1	3,245.1	EA
Nickel, Total	0.01582		mg/l	0.00200	0.00055	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Selenium, Total	0.06424		mg/l	0.00500	0.00173	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00100	0.00026	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Thallium, Total	ND		mg/l	0.00100	0.00014	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV
Zinc, Total	0.01085		mg/l	0.01000	0.00341	1	09/23/16 12:20	09/24/16 13:36	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

SAMPLE RESULTS

Lab ID: L1630097-02
 Client ID: AIR-OCL-WC-SW
 Sample Location: VA
 Matrix: Water

Date Collected: 09/22/16 12:30
 Date Received: 09/22/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01297		mg/l	0.00200	0.00042	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00303		mg/l	0.00100	0.00016	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00024	J	mg/l	0.00100	0.00005	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Chromium, Total	0.00325		mg/l	0.00100	0.00017	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Copper, Total	0.00132		mg/l	0.00100	0.00038	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Iron, Total	ND		mg/l	0.050	0.020	1	09/23/16 12:20	09/24/16 00:00	EPA 3005A	19,200.7	PS
Lead, Total	ND		mg/l	0.00100	0.00034	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	09/23/16 10:34	09/23/16 18:40	EPA 245.1	3,245.1	EA
Nickel, Total	0.00973		mg/l	0.00200	0.00055	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Selenium, Total	0.06409		mg/l	0.00500	0.00173	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00100	0.00026	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Thallium, Total	ND		mg/l	0.00100	0.00014	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV
Zinc, Total	ND		mg/l	0.01000	0.00341	1	09/23/16 12:20	09/24/16 12:45	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG935117-1									
Mercury, Total	ND	mg/l	0.00020	0.00006	1	09/23/16 10:34	09/23/16 18:17	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst	
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG935162-1										
Antimony, Total	0.00090	J	mg/l	0.00200	0.00042	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Arsenic, Total	0.00031	J	mg/l	0.00100	0.00016	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Cadmium, Total	ND		mg/l	0.00100	0.00005	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Chromium, Total	ND		mg/l	0.00100	0.00017	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Copper, Total	ND		mg/l	0.00100	0.00038	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Lead, Total	ND		mg/l	0.00100	0.00034	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Nickel, Total	ND		mg/l	0.00200	0.00055	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Selenium, Total	ND		mg/l	0.00500	0.00173	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Silver, Total	ND		mg/l	0.00100	0.00026	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Thallium, Total	ND		mg/l	0.00100	0.00014	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV
Zinc, Total	ND		mg/l	0.0100	0.00341	1	09/23/16 12:20	09/24/16 12:36	3,200.8	BV

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst	
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG935164-1										
Iron, Total	ND		mg/l	0.050	0.020	1	09/23/16 12:20	09/23/16 23:52	19,200.7	PS

Prep Information

Digestion Method: EPA 3005A



Serial_No:09261616:29

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG935117-2								
Mercury, Total	92		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG935162-2								
Antimony, Total	91		-		85-115	-		
Arsenic, Total	103		-		85-115	-		
Cadmium, Total	107		-		85-115	-		
Chromium, Total	98		-		85-115	-		
Copper, Total	100		-		85-115	-		
Lead, Total	103		-		85-115	-		
Nickel, Total	101		-		85-115	-		
Selenium, Total	100		-		85-115	-		
Silver, Total	97		-		85-115	-		
Thallium, Total	102		-		85-115	-		
Zinc, Total	98		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG935164-2								
Iron, Total	93		-		85-115	-		



**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02			QC Batch ID: WG935117-4			QC Sample: L1630097-01			Client ID: AIR-OCL-FE-SW			
Mercury, Total	ND	0.005	0.00420	84		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02			QC Batch ID: WG935162-4			QC Sample: L1630097-02			Client ID: AIR-OCL-WC-SW			
Antimony, Total	0.01297	0.5	0.5032	98		-	-		70-130	-		20
Arsenic, Total	0.00303	0.12	0.1233	100		-	-		70-130	-		20
Cadmium, Total	0.00024J	0.051	0.05327	104		-	-		70-130	-		20
Chromium, Total	0.00325	0.2	0.1963	96		-	-		70-130	-		20
Copper, Total	0.00132	0.25	0.2499	99		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5211	102		-	-		70-130	-		20
Nickel, Total	0.00973	0.5	0.5084	100		-	-		70-130	-		20
Selenium, Total	0.06409	0.12	0.1916	106		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04861	97		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1022	85		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.4749	95		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02			QC Batch ID: WG935164-4			QC Sample: L1630097-02			Client ID: AIR-OCL-WC-SW			
Iron, Total	ND	1	0.959	96		-	-		75-125	-		20



Serial_No:09261616:29

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG935117-3 QC Sample: L1630097-01 Client ID: AIR-OCL-FE-SW						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG935162-3 QC Sample: L1630097-02 Client ID: AIR-OCL-WC-SW						
Antimony, Total	0.01297	0.01211	mg/l	7		20
Arsenic, Total	0.00303	0.00300	mg/l	1		20
Cadmium, Total	0.00024J	0.00022J	mg/l	NC		20
Chromium, Total	0.00325	0.00328	mg/l	1		20
Copper, Total	0.00132	0.00176	mg/l	29	Q	20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	0.00973	0.00895	mg/l	8		20
Selenium, Total	0.06409	0.06505	mg/l	1		20
Silver, Total	ND	ND	mg/l	NC		20
Thallium, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG935164-3 QC Sample: L1630097-02 Client ID: AIR-OCL-WC-SW						
Iron, Total	ND	ND	mg/l	NC		20



Project Name: DOMINION CHESTERFIELD**Project Number:** Not Specified**Lab Number:** L1630097**Report Date:** 09/26/16**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

Cooler Information Custody Seal**Cooler**

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1630097-01A	Plastic 500ml HNO3 preserved	A	<2	3.2	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1630097-02A	Plastic 500ml HNO3 preserved	A	<2	3.2	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1630097
Report Date: 09/26/16

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 <p>NEW JERSEY CHAIN OF CUSTODY</p> <p>Westborough, MA 01581 8 Walkup Dr. TEL: 508-899-8220 FAX: 508-898-9193</p> <p>Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288</p>	<p>Service Centers</p> <p>Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105</p>	<p>Page <u>1</u> of <u>1</u></p>	<p>Date Rec'd in Lab <u>9/22/16</u></p>	<p>ALPHA Job # <u>W1630097</u></p>	
	<p>Project Information</p> <p>Project Name: <u>DANIEL CHESTERFIELD</u></p> <p>Project Location: <u>VA</u></p>	<p>Deliverables</p> <p><input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQuIS (1 File) <input type="checkbox"/> EQuIS (4 File) <input type="checkbox"/> Other</p>	<p>Billing Information</p> <p><input checked="" type="checkbox"/> Same as Client Info PO #</p>		
<p>Client Information</p> <p>Client: <u>GWTT</u></p> <p>Address: <u>627 Mt. Hope Rd</u> <u>Washington, NJ 07885</u></p> <p>Phone: <u>973-983-0901</u></p> <p>Fax: <u>-0903</u></p> <p>Email:</p>	<p>Project #</p> <p>(Use Project name as Project #) <input checked="" type="checkbox"/></p> <p>Project Manager: <u>Ric Orlando</u></p> <p>ALPHAQuote #:</p> <p>Turn-Around Time Standard <input type="checkbox"/> Due Date: <u>2</u> Rush (only if pre approved) <input checked="" type="checkbox"/> # of Days: <u>9/26/16</u></p>	<p>Regulatory Requirement</p> <p><input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input type="checkbox"/> Other</p>	<p>Site Information</p> <p>Is this site impacted by Petroleum? Yes <input type="checkbox"/></p> <p>Petroleum Product:</p>		
<p>These samples have been previously analyzed by Alpha <input type="checkbox"/></p> <p>For EPH, selection is REQUIRED: <input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2</p>	<p>For VOC, selection is REQUIRED: <input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011</p>	<p>Other project specific requirements/comments: <u>Metals 200.8</u> <u>Tl, Zn</u> <u>Sb, As, Cd, Cr, Cu, Fe, Hg, Pb, Ni, Ag, Se,</u></p>	<p>ANALYSIS</p> <p>TOTAL METALS</p>	<p>Sample Filtration</p> <p><input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)</p>	
<p>ALPHA Lab ID (Lab Use Only)</p>	<p>Sample ID</p>	<p>Collection Date Time</p>	<p>Sample Matrix</p>	<p>Sampler's Initials</p>	<p>Sample Specific Comments</p>
	<u>AIR-OCL-FE-SW</u>	<u>9/22/16 1200</u>	<u>WW</u>	<u>RMD</u>	
	<u>AIR-OCL-WC-SW</u>	<u>9/22/16 1230</u>	<u>WW</u>	<u>RMD</u>	
<p>Preservative Code: A = None B = HCl C = HNO₃ D = H₂SO₄ E = NaOH F = MeOH G = NaHSO₄ H = Na₂S₂O₃ K/E = Zn Ac/NaOH O = Other</p>	<p>Container Code P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle</p>	<p>Westboro: Certification No: MA935 Mansfield: Certification No: MA015</p>	<p>Container Type <u>P</u></p> <p>Preservative <u>C</u></p>	<p>Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)</p>	
<p>Relinquished By: <u>[Signature]</u></p>		<p>Date/Time: <u>9/22/16 1800</u></p>	<p>Received By: <u>[Signature]</u></p>		<p>Date/Time: <u>9/22/16 1800</u></p>
<p>Relinquished By: <u>[Signature]</u></p>		<p>Date/Time: <u>9/22/16 1810</u></p>	<p>Received By: <u>[Signature]</u></p>		<p>Date/Time: <u>9/22/16 1810</u></p>
<p>Relinquished By: <u>[Signature]</u></p>		<p>Date/Time: <u>9-22-16 2320</u></p>	<p>Received By: <u>[Signature]</u></p>		<p>Date/Time: <u>9/22/16 2320</u></p>



ANALYTICAL REPORT

Lab Number:	L1631226
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	Not Specified
Report Date:	10/05/16

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Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:10051614:38

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1631226-01	SW-JAR 1	WATER	VA	09/30/16 11:30	09/30/16
L1631226-02	SW-JAR 2	WATER	VA	09/30/16 11:45	09/30/16
L1631226-03	SW-JAR 3	WATER	VA	09/30/16 12:00	09/30/16
L1631226-04	SW-JAR 4	WATER	VA	09/30/16 12:15	09/30/16
L1631226-05	SW-JAR1-AA	WATER	VA	09/30/16 16:00	09/30/16
L1631226-06	SW-JAR2-AA	WATER	VA	09/30/16 16:00	09/30/16
L1631226-07	SW-JAR3-AA	WATER	VA	09/30/16 16:30	09/30/16
L1631226-08	SW-JAR4-AA	WATER	VA	09/30/16 16:30	09/30/16

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Kelly Stenstrom

Title: Technical Director/Representative

Date: 10/05/16

METALS

Project Name: DOMINION CHESTERFIELD

Lab Number: L1631226

Project Number: Not Specified

Report Date: 10/05/16

SAMPLE RESULTS

Lab ID: L1631226-01

Date Collected: 09/30/16 11:30

Client ID: SW-JAR 1

Date Received: 09/30/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0055		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0006	J	mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Cadmium, Total	0.0002	J	mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Chromium, Total	0.0050		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Copper, Total	0.0031		mg/l	0.0010	0.0004	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Iron, Total	ND		mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 16:23	EPA 3005A	19,200.7	PS
Lead, Total	0.0023		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:41	EPA 245.1	3,245.1	BV
Nickel, Total	0.0161		mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Selenium, Total	0.0681		mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT
Zinc, Total	0.0308		mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 11:35	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

SAMPLE RESULTS

Lab ID: L1631226-02
 Client ID: SW-JAR 2
 Sample Location: VA
 Matrix: Water

Date Collected: 09/30/16 11:45
 Date Received: 09/30/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0127		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0577		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Cadmium, Total	0.0003	J	mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Chromium, Total	0.0038		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Copper, Total	0.0017		mg/l	0.0010	0.0004	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Iron, Total	ND		mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 16:43	EPA 3005A	19,200.7	PS
Lead, Total	0.0015		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:12	EPA 245.1	3,245.1	BV
Nickel, Total	0.010		mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Selenium, Total	0.0588		mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Thallium, Total	0.001		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT
Zinc, Total	0.0076	J	mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 11:43	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

SAMPLE RESULTS

Lab ID: L1631226-03
 Client ID: SW-JAR 3
 Sample Location: VA
 Matrix: Water

Date Collected: 09/30/16 12:00
 Date Received: 09/30/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0133		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0018		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Cadmium, Total	0.0003	J	mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Chromium, Total	0.0022		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Copper, Total	0.0019		mg/l	0.0010	0.0004	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Iron, Total	0.047	J	mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 16:48	EPA 3005A	19,200.7	AB
Lead, Total	0.0023		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:47	EPA 245.1	3,245.1	BV
Nickel, Total	0.0112		mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Selenium, Total	0.0523		mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Thallium, Total	0.0011		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT
Zinc, Total	0.0123		mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 11:46	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

SAMPLE RESULTS

Lab ID: L1631226-04
 Client ID: SW-JAR 4
 Sample Location: VA
 Matrix: Water

Date Collected: 09/30/16 12:15
 Date Received: 09/30/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0047		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0007	J	mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Cadmium, Total	0.0002	J	mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Chromium, Total	0.0060		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Copper, Total	0.0035		mg/l	0.0010	0.0004	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Iron, Total	ND		mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 17:31	EPA 3005A	19,200.7	AB
Lead, Total	0.0018		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:48	EPA 245.1	3,245.1	BV
Nickel, Total	0.0155		mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Selenium, Total	0.0630		mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT
Zinc, Total	0.0408		mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 11:49	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

SAMPLE RESULTS

Lab ID: L1631226-05
 Client ID: SW-JAR1-AA
 Sample Location: VA
 Matrix: Water

Date Collected: 09/30/16 16:00
 Date Received: 09/30/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0003	J	mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Chromium, Total	0.0040		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Copper, Total	0.0011		mg/l	0.0010	0.0004	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Iron, Total	ND		mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 17:36	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:50	EPA 245.1	3,245.1	BV
Nickel, Total	0.0007	J	mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Selenium, Total	0.0021	J	mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT
Zinc, Total	0.0239		mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 11:52	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

SAMPLE RESULTS

Lab ID: L1631226-06
 Client ID: SW-JAR2-AA
 Sample Location: VA
 Matrix: Water

Date Collected: 09/30/16 16:00
 Date Received: 09/30/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0002	J	mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Chromium, Total	0.0040		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Copper, Total	0.0014		mg/l	0.0010	0.0004	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Iron, Total	ND		mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 17:41	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:52	EPA 245.1	3,245.1	BV
Nickel, Total	ND		mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Selenium, Total	0.0024	J	mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT
Zinc, Total	ND		mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 12:06	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

SAMPLE RESULTS

Lab ID: L1631226-07
 Client ID: SW-JAR3-AA
 Sample Location: VA
 Matrix: Water

Date Collected: 09/30/16 16:30
 Date Received: 09/30/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0002	J	mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Chromium, Total	0.0037		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Copper, Total	0.00098	J	mg/l	0.00100	0.00038	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Iron, Total	ND		mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 17:46	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:53	EPA 245.1	3,245.1	BV
Nickel, Total	ND		mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Selenium, Total	ND		mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT
Zinc, Total	0.0044	J	mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 12:09	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

SAMPLE RESULTS

Lab ID: L1631226-08
 Client ID: SW-JAR4-AA
 Sample Location: VA
 Matrix: Water

Date Collected: 09/30/16 16:30
 Date Received: 09/30/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Arsenic, Total	0.0002	J	mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Chromium, Total	0.0013		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Copper, Total	0.0005	J	mg/l	0.0010	0.0004	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Iron, Total	ND		mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 17:51	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:55	EPA 245.1	3,245.1	BV
Nickel, Total	ND		mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Selenium, Total	ND		mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT
Zinc, Total	ND		mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 12:12	EPA 3005A	3,200.8	TT



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-08 Batch: WG937841-1										
Antimony, Total	ND		mg/l	0.0040	0.0004	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Arsenic, Total	ND		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Chromium, Total	ND		mg/l	0.0010	0.0002	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Copper, Total	ND		mg/l	0.0010	0.0004	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Lead, Total	0.0005	J	mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Nickel, Total	ND		mg/l	0.0020	0.0006	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Selenium, Total	0.0022	J	mg/l	0.0050	0.0017	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Silver, Total	ND		mg/l	0.0010	0.0003	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT
Zinc, Total	ND		mg/l	0.0100	0.0034	1	10/01/16 10:20	10/03/16 10:48	3,200.8	TT

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-08 Batch: WG937842-1										
Iron, Total	ND		mg/l	0.050	0.020	1	10/01/16 10:20	10/03/16 16:10	19,200.7	PS

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-08 Batch: WG938155-1										
Mercury, Total	ND		mg/l	0.00010	0.00006	1	10/04/16 09:25	10/04/16 14:09	3,245.1	BV

Prep Information

Digestion Method: EPA 245.1



Serial_No:10051614:38

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-08 Batch: WG937841-2								
Antimony, Total	99		-		85-115	-		
Arsenic, Total	101		-		85-115	-		
Cadmium, Total	106		-		85-115	-		
Chromium, Total	104		-		85-115	-		
Copper, Total	103		-		85-115	-		
Lead, Total	110		-		85-115	-		
Nickel, Total	107		-		85-115	-		
Selenium, Total	90		-		85-115	-		
Silver, Total	105		-		85-115	-		
Thallium, Total	110		-		85-115	-		
Zinc, Total	96		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-08 Batch: WG937842-2								
Iron, Total	89		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-08 Batch: WG938155-2								
Mercury, Total	111		-		85-115	-		



Serial_No:10051614:38

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-08 QC Batch ID: WG937841-4 QC Sample: L1631226-01 Client ID: SW-JAR 1												
Antimony, Total	0.0055	0.5	0.5477	108		-	-		70-130	-		20
Arsenic, Total	0.0006J	0.12	0.1227	102		-	-		70-130	-		20
Cadmium, Total	0.0002J	0.051	0.0530	104		-	-		70-130	-		20
Chromium, Total	0.0050	0.2	0.2026	99		-	-		70-130	-		20
Copper, Total	0.0031	0.25	0.2560	101		-	-		70-130	-		20
Lead, Total	0.0023	0.51	0.5438	106		-	-		70-130	-		20
Nickel, Total	0.0161	0.5	0.5291	103		-	-		70-130	-		20
Selenium, Total	0.0681	0.12	0.2138	121		-	-		70-130	-		20
Silver, Total	ND	0.05	0.0499	100		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1235	103		-	-		70-130	-		20
Zinc, Total	0.0308	0.5	0.4969	93		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-08 QC Batch ID: WG937842-4 QC Sample: L1631226-01 Client ID: SW-JAR 1												
Iron, Total	ND	1	0.922	92		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-08 QC Batch ID: WG938155-4 QC Sample: L1631226-02 Client ID: SW-JAR 2												
Mercury, Total	ND	0.005	0.00436	87		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-08 QC Batch ID: WG938155-6 QC Sample: L1630963-01 Client ID: MS Sample												
Mercury, Total	0.00007J	0.005	0.00473	95		-	-		70-130	-		20



Serial_No:10051614:38

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-08 QC Batch ID: WG937841-3 QC Sample: L1631226-01 Client ID: SW-JAR 1						
Antimony, Total	0.0055	0.0052	mg/l	4		20
Arsenic, Total	0.0006J	0.0008J	mg/l	NC		20
Cadmium, Total	0.0002J	0.0003J	mg/l	NC		20
Chromium, Total	0.0050	0.0053	mg/l	5		20
Copper, Total	0.0031	0.0032	mg/l	5		20
Lead, Total	0.0023	0.0023	mg/l	3		20
Nickel, Total	0.0161	0.0169	mg/l	5		20
Selenium, Total	0.0681	0.0697	mg/l	2		20
Silver, Total	ND	ND	mg/l	NC		20
Thallium, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.0308	0.0310	mg/l	1		20
Total Metals - Mansfield Lab Associated sample(s): 01-08 QC Batch ID: WG937842-3 QC Sample: L1631226-01 Client ID: SW-JAR 1						
Iron, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-08 QC Batch ID: WG938155-3 QC Sample: L1631226-02 Client ID: SW-JAR 2						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-08 QC Batch ID: WG938155-5 QC Sample: L1630963-01 Client ID: DUP Sample						
Mercury, Total	0.00007J	0.00008J	mg/l	NC		20



Project Name: DOMINION CHESTERFIELD

Lab Number: L1631226

Project Number: Not Specified

Report Date: 10/05/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1631226-01A	Plastic 250ml HNO3 preserved	A	<2	3.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1631226-02A	Plastic 250ml HNO3 preserved	A	<2	3.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1631226-03A	Plastic 250ml HNO3 preserved	A	<2	3.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1631226-04A	Plastic 250ml HNO3 preserved	A	<2	3.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1631226-05A	Plastic 250ml HNO3 preserved	A	<2	3.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1631226-06A	Plastic 250ml HNO3 preserved	A	<2	3.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1631226-07A	Plastic 250ml HNO3 preserved	A	<2	3.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD**Project Number:** Not Specified**Lab Number:** L1631226**Report Date:** 10/05/16**Container Information**

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1631226-08A	Plastic 250ml HNO3 preserved	A	<2	3.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1631226
Report Date: 10/05/16

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 <p>NEW JERSEY CHAIN OF CUSTODY</p> <p>Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193</p> <p>Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288</p>	<p>Service Centers Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105</p>	<p>Page 1 of 1</p>	<p>Date Rec'd in Lab 9/30/16</p>	<p>ALPHA Job # L1631226</p>	
	<p>Project Information</p> <p>Project Name: <u>DOMINION CHESTERFIELD</u></p> <p>Project Location: <u>VA</u></p> <p>Project #</p>	<p>Deliverables</p> <p><input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> EQUIS (4 File) <input type="checkbox"/> Other</p>	<p>Billing Information</p> <p><input checked="" type="checkbox"/> Same as Client Info PO #</p>		
<p>Client Information</p> <p>Client: <u>GWTT</u></p> <p>Address: <u>622 Rt. Hope Rd</u> <u>Washington, NJ 07885</u></p> <p>Phone: <u>973-983-1501</u></p> <p>Fax: <u>-0903</u></p> <p>Email:</p>	<p>(Use Project name as Project #) <input checked="" type="checkbox"/></p> <p>Project Manager: <u>ROS DELANNO</u></p> <p>ALPHAQuote #:</p> <p>Turn-Around Time</p> <p>Standard <input type="checkbox"/> Due Date: <u>10/5/16</u> Rush (only if pre approved) <input checked="" type="checkbox"/> # of Days: <u>3</u></p>	<p>Regulatory Requirement</p> <p><input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input type="checkbox"/> Other</p>	<p>Site Information</p> <p>Is this site impacted by Petroleum? Yes <input type="checkbox"/></p> <p>Petroleum Product:</p>		
<p>These samples have been previously analyzed by Alpha <input type="checkbox"/></p> <p>For EPH, selection is REQUIRED:</p> <p><input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2</p>	<p>For VOC, selection is REQUIRED:</p> <p><input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011</p>	<p>Other project specific requirements/comments:</p> <p><u>Metals by 2400.8</u> <u>TI, ZN</u> <u>Sb, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag</u></p>	<p>ANALYSIS</p> <p><u>Total Metals</u></p>	<p>Sample Filtration</p> <p><input type="checkbox"/> Done <input type="checkbox"/> Lab to do <input type="checkbox"/> Lab to do (Please Specify below)</p>	
<p>ALPHA Lab ID (Lab Use Only)</p>	<p>Sample ID</p>	<p>Collection Date Time</p>	<p>Sample Matrix</p>	<p>Sampler's Initials</p>	<p>Sample Specific Comments</p>
<u>31226-01</u>	<u>SW-TAP 1</u>	<u>9/30/16 1130</u>	<u>WW</u>	<u>DTD</u>	
<u>02</u>	<u>SW-TAP 2</u>	<u>9/30/16 1145</u>	<u>WW</u>	<u>DTD</u>	
<u>03</u>	<u>SW-TAP 3</u>	<u>9/30/16 1200</u>	<u>WW</u>	<u>DTD</u>	
<u>04</u>	<u>SW-TAP 4</u>	<u>9/30/16 1215</u>	<u>WW</u>	<u>DTD</u>	
<u>05</u>	<u>SW-TAP 2-AA</u>	<u>9/30/16 1600</u>	<u>WW</u>	<u>DTD</u>	
<u>06</u>	<u>SW-TAP 2-AA</u>	<u>9/30/16 1600</u>	<u>WW</u>	<u>DTD</u>	
<u>07</u>	<u>SW-TAP 3-AA</u>	<u>9/30/16 1630</u>	<u>WW</u>	<u>DTD</u>	
<u>08</u>	<u>SW-TAP 4-AA</u>	<u>9/30/16 1630</u>	<u>WW</u>	<u>DTD</u>	
<p>Preservative Code: A = None B = HCl C = HNO₃ D = H₂SO₄ E = NaOH F = MeOH G = NaHSO₄ H = Na₂S₂O₃ K/E = Zn Ac/NaOH O = Other</p>	<p>Container Code P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle</p>	<p>Westboro: Certification No: MA935 Mansfield: Certification No: MA015</p>	<p>Container Type <u>P</u></p> <p>Preservative <u>C</u></p>	<p>Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)</p>	
<p>Form No: 01-14 HC (rev. 30-Sept-2013)</p>	<p>Relinquished By: <u>[Signature]</u></p>	<p>Date/Time: <u>9/30/16 1740</u></p>	<p>Received By: <u>[Signature]</u></p>	<p>Date/Time: <u>9/30/16 1740</u></p>	
	<p><u>[Signature]</u></p>	<p><u>9/30/16 1800</u></p>	<p><u>[Signature]</u></p>	<p><u>9/30/16 1800</u></p>	
	<p><u>[Signature]</u></p>	<p><u>9/30/16 2345</u></p>	<p><u>[Signature]</u></p>	<p><u>9/30/16 2345</u></p>	



ANALYTICAL REPORT

Lab Number:	L1632179
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	Not Specified
Report Date:	10/12/16

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:10121616:44

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1632179-01	INFLUENT	WATER	VA	10/07/16 13:00	10/07/16
L1632179-02	BAM 1	WATER	VA	10/07/16 13:15	10/07/16
L1632179-03	BAM 2	WATER	VA	10/07/16 13:30	10/07/16
L1632179-04	BAM 3	WATER	VA	10/07/16 13:45	10/07/16
L1632179-05	BAM 4	WATER	VA	10/07/16 14:00	10/07/16
L1632179-06	ZVI 1	WATER	VA	10/07/16 14:15	10/07/16
L1632179-07	ZVI 2	WATER	VA	10/07/16 14:30	10/07/16
L1632179-08	ZVI 3	WATER	VA	10/07/16 14:45	10/07/16
L1632179-09	ZVI 4	WATER	VA	10/07/16 15:00	10/07/16

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Amita Naik

Title: Technical Director/Representative

Date: 10/12/16

METALS

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-01
 Client ID: INFLUENT
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 13:00
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01214		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00135		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00049	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Chromium, Total	0.00208		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Copper, Total	0.00397		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Iron, Total	0.078		mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 15:48	EPA 3005A	19,200.7	AB
Lead, Total	0.00091	J	mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:29	EPA 245.1	3,245.1	EA
Nickel, Total	0.00886		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Selenium, Total	0.06266		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Thallium, Total	0.00031	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV
Zinc, Total	0.05744		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 13:17	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-02
 Client ID: BAM 1
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 13:15
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01564		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00156		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00024	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Chromium, Total	0.00221		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Copper, Total	0.00418		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Iron, Total	0.054		mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 16:46	EPA 3005A	19,200.7	AB
Lead, Total	0.00133		mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:40	EPA 245.1	3,245.1	EA
Nickel, Total	0.00968		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Selenium, Total	0.06446		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Thallium, Total	0.00046	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV
Zinc, Total	0.05880		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 13:32	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-03
 Client ID: BAM 2
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 13:30
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01406		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00143		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00029	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Chromium, Total	0.00325		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Copper, Total	0.00489		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Iron, Total	0.060		mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 16:50	EPA 3005A	19,200.7	AB
Lead, Total	0.00060	J	mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:42	EPA 245.1	3,245.1	EA
Nickel, Total	0.00996		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Selenium, Total	0.06459		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Thallium, Total	0.00033	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV
Zinc, Total	0.05280		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 13:36	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-04
 Client ID: BAM 3
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 13:45
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01007		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00131		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00028	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Chromium, Total	0.00179		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Copper, Total	0.00513		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Iron, Total	0.046	J	mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 16:55	EPA 3005A	19,200.7	AB
Lead, Total	0.00106		mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:44	EPA 245.1	3,245.1	EA
Nickel, Total	0.00872		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Selenium, Total	0.06095		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Thallium, Total	0.00028	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV
Zinc, Total	0.05453		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 13:41	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD

Lab Number: L1632179

Project Number: Not Specified

Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-05

Date Collected: 10/07/16 14:00

Client ID: BAM 4

Date Received: 10/07/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01007		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00130		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00025	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Chromium, Total	0.00189		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Copper, Total	0.00450		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Iron, Total	0.048	J	mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 16:59	EPA 3005A	19,200.7	AB
Lead, Total	0.00055	J	mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:46	EPA 245.1	3,245.1	EA
Nickel, Total	0.00941		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Selenium, Total	0.06116		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Thallium, Total	0.00032	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV
Zinc, Total	0.04628		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 13:45	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-06
 Client ID: ZVI 1
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 14:15
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01272		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00140		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00024	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Chromium, Total	0.00200		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Copper, Total	0.00457		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Iron, Total	0.505		mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 17:03	EPA 3005A	19,200.7	AB
Lead, Total	0.00093	J	mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:47	EPA 245.1	3,245.1	EA
Nickel, Total	0.00912		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Selenium, Total	0.06468		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Thallium, Total	0.00030	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV
Zinc, Total	0.05658		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 13:49	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD

Lab Number: L1632179

Project Number: Not Specified

Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-07

Date Collected: 10/07/16 14:30

Client ID: ZVI 2

Date Received: 10/07/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01382		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00135		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00026	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Chromium, Total	0.00216		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Copper, Total	0.00484		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Iron, Total	1.08		mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 17:08	EPA 3005A	19,200.7	AB
Lead, Total	0.00064	J	mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:49	EPA 245.1	3,245.1	EA
Nickel, Total	0.00957		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Selenium, Total	0.06451		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Silver, Total	0.00034	J	mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Thallium, Total	0.00029	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV
Zinc, Total	0.05903		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 14:02	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-08
 Client ID: ZVI 3
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 14:45
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01692		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00124		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00025	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Chromium, Total	0.00229		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Copper, Total	0.00431		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Iron, Total	1.50		mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 17:12	EPA 3005A	19,200.7	AB
Lead, Total	0.00084	J	mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:51	EPA 245.1	3,245.1	EA
Nickel, Total	0.00967		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Selenium, Total	0.06510		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Thallium, Total	0.00028	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV
Zinc, Total	0.05295		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 14:06	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-09
 Client ID: ZVI 4
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 15:00
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01168		mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00123		mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Cadmium, Total	0.00030	J	mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Chromium, Total	0.00195		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Copper, Total	0.00536		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Iron, Total	1.88		mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 17:16	EPA 3005A	19,200.7	AB
Lead, Total	0.00068	J	mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 23:00	EPA 245.1	3,245.1	EA
Nickel, Total	0.01006		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Selenium, Total	0.06287		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Thallium, Total	0.00027	J	mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV
Zinc, Total	0.05206		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 14:10	EPA 3005A	3,200.8	BV



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-09 Batch: WG940477-1									
Iron, Total	ND	mg/l	0.050	0.020	1	10/10/16 11:30	10/10/16 15:23	19,200.7	JH

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst	
Total Metals - Mansfield Lab for sample(s): 01-09 Batch: WG940478-1										
Antimony, Total	0.00255	J	mg/l	0.00400	0.00042	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Arsenic, Total	0.00018	J	mg/l	0.00100	0.00016	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Cadmium, Total	ND		mg/l	0.00100	0.00005	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Chromium, Total	ND		mg/l	0.00100	0.00017	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Copper, Total	ND		mg/l	0.00100	0.00038	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Lead, Total	ND		mg/l	0.00100	0.00034	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Nickel, Total	ND		mg/l	0.00200	0.00055	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Selenium, Total	ND		mg/l	0.00500	0.00173	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	0.00026	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Thallium, Total	ND		mg/l	0.00100	0.00014	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV
Zinc, Total	ND		mg/l	0.01000	0.00341	1	10/10/16 11:30	10/12/16 13:00	3,200.8	BV

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst	
Total Metals - Mansfield Lab for sample(s): 01-09 Batch: WG940959-1										
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/11/16 14:46	10/11/16 22:25	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1



Serial_No:10121616:44

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-09 Batch: WG940477-2								
Iron, Total	99		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-09 Batch: WG940478-2								
Antimony, Total	89		-		85-115	-		
Arsenic, Total	102		-		85-115	-		
Cadmium, Total	111		-		85-115	-		
Chromium, Total	101		-		85-115	-		
Copper, Total	107		-		85-115	-		
Lead, Total	104		-		85-115	-		
Nickel, Total	105		-		85-115	-		
Selenium, Total	105		-		85-115	-		
Silver, Total	104		-		85-115	-		
Thallium, Total	102		-		85-115	-		
Zinc, Total	100		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-09 Batch: WG940959-2								
Mercury, Total	92		-		85-115	-		



**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG940477-4 QC Sample: L1632179-01 Client ID: INFLUENT												
Iron, Total	0.078	1	0.951	87		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG940478-4 QC Sample: L1632179-01 Client ID: INFLUENT												
Antimony, Total	0.01214	0.5	0.5103	100		-	-		70-130	-		20
Arsenic, Total	0.00135	0.12	0.1145	94		-	-		70-130	-		20
Cadmium, Total	0.00049J	0.051	0.04972	97		-	-		70-130	-		20
Chromium, Total	0.00208	0.2	0.1728	85		-	-		70-130	-		20
Copper, Total	0.00397	0.25	0.2169	85		-	-		70-130	-		20
Lead, Total	0.00091J	0.51	0.5234	103		-	-		70-130	-		20
Nickel, Total	0.00886	0.5	0.4323	85		-	-		70-130	-		20
Selenium, Total	0.06266	0.12	0.1780	96		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04519	90		-	-		70-130	-		20
Thallium, Total	0.00031J	0.12	0.1177	98		-	-		70-130	-		20
Zinc, Total	0.05744	0.5	0.4526	79		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG940959-4 QC Sample: L1632179-01 Client ID: INFLUENT												
Mercury, Total	ND	0.005	0.00445	89		-	-		70-130	-		20



Serial_No:10121616:44

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG940477-3 QC Sample: L1632179-01 Client ID: INFLUENT						
Iron, Total	0.078	0.079	mg/l	2		20
Total Metals - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG940478-3 QC Sample: L1632179-01 Client ID: INFLUENT						
Antimony, Total	0.01214	0.01099	mg/l	10		20
Arsenic, Total	0.00135	0.00132	mg/l	2		20
Cadmium, Total	0.00049J	0.00034J	mg/l	NC		20
Chromium, Total	0.00208	0.00212	mg/l	2		20
Copper, Total	0.00397	0.00369	mg/l	7		20
Lead, Total	0.00091J	0.00093J	mg/l	NC		20
Nickel, Total	0.00886	0.00890	mg/l	0		20
Selenium, Total	0.06266	0.06347	mg/l	1		20
Silver, Total	ND	ND	mg/l	NC		20
Thallium, Total	0.00031J	0.00029J	mg/l	NC		20
Zinc, Total	0.05744	0.05742	mg/l	0		20
Total Metals - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG940959-3 QC Sample: L1632179-01 Client ID: INFLUENT						
Mercury, Total	ND	ND	mg/l	NC		20



INORGANICS & MISCELLANEOUS

Project Name: DOMINION CHESTERFIELD**Lab Number:** L1632179**Project Number:** Not Specified**Report Date:** 10/12/16**SAMPLE RESULTS**

Lab ID: L1632179-01

Date Collected: 10/07/16 13:00

Client ID: INFLUENT

Date Received: 10/07/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	190		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-02
Client ID: BAM 1
Sample Location: VA
Matrix: Water

Date Collected: 10/07/16 13:15
Date Received: 10/07/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	220		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD

Lab Number: L1632179

Project Number: Not Specified

Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-03

Date Collected: 10/07/16 13:30

Client ID: BAM 2

Date Received: 10/07/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	190		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD

Lab Number: L1632179

Project Number: Not Specified

Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-04

Date Collected: 10/07/16 13:45

Client ID: BAM 3

Date Received: 10/07/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	180		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-05
Client ID: BAM 4
Sample Location: VA
Matrix: Water

Date Collected: 10/07/16 14:00
Date Received: 10/07/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	170		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD**Lab Number:** L1632179**Project Number:** Not Specified**Report Date:** 10/12/16**SAMPLE RESULTS**

Lab ID: L1632179-06

Date Collected: 10/07/16 14:15

Client ID: ZVI 1

Date Received: 10/07/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	200		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD**Lab Number:** L1632179**Project Number:** Not Specified**Report Date:** 10/12/16**SAMPLE RESULTS**

Lab ID: L1632179-07

Date Collected: 10/07/16 14:30

Client ID: ZVI 2

Date Received: 10/07/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	210		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-08
 Client ID: ZVI 3
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 14:45
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	200		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

SAMPLE RESULTS

Lab ID: L1632179-09
 Client ID: ZVI 4
 Sample Location: VA
 Matrix: Water

Date Collected: 10/07/16 15:00
 Date Received: 10/07/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Sulfate	190		mg/l	100	14.	10	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Project Name: DOMINION CHESTERFIELD

Lab Number: L1632179

Project Number: Not Specified

Report Date: 10/12/16

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-09 Batch: WG940885-1										
Sulfate	1.7	J	mg/l	10	1.4	1	10/12/16 09:40	10/12/16 09:40	121,4500SO4-E	AW



Serial_No:10121616:44

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-09 Batch: WG940885-2								
Sulfate	90		-		84-121	-		



Serial_No:10121616:44

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-09 QC Batch ID: WG940885-4 QC Sample: L1632155-01 Client ID: MS Sample												
Sulfate	170	500	660	99		-	-		55-147	-		14



Serial_No:10121616:44

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-09 QC Batch ID: WG940885-3 QC Sample: L1632155-01 Client ID: DUP Sample						
Sulfate	170	180	mg/l	6		14



Project Name: DOMINION CHESTERFIELD**Project Number:** Not Specified**Lab Number:** L1632179**Report Date:** 10/12/16**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

Cooler Information Custody Seal**Cooler**

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1632179-01A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-01B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)
L1632179-02A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-02B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)
L1632179-03A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-03B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)
L1632179-04A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-04B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)
L1632179-05A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-05B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD

Project Number: Not Specified

Lab Number: L1632179

Report Date: 10/12/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1632179-06A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-06B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)
L1632179-07A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-07B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)
L1632179-08A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-08B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)
L1632179-09A	Plastic 250ml HNO3 preserved	A	<2	4.0	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1632179-09B	Plastic 250ml unpreserved	A	7	4.0	Y	Absent	SO4-4500(28)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD**Lab Number:** L1632179**Project Number:** Not Specified**Report Date:** 10/12/16**Data Qualifiers**

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: Not Specified

Lab Number: L1632179
Report Date: 10/12/16

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L1632435
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	14-3136
Report Date:	10/18/16

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:10181611:17

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1632435-01	SW EFFLUENT	WATER	VA	10/10/16 17:00	10/11/16

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

Case Narrative (continued)

Report Submission

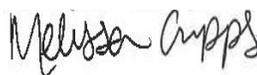
All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Chloride

The WG941868-4 MS recovery (50%), performed on L1632435-01, does not apply because the sample concentration is greater than four times the spike amount added.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Melissa Cripps

Title: Technical Director/Representative

Date: 10/18/16

INORGANICS & MISCELLANEOUS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

SAMPLE RESULTS

Lab ID: L1632435-01
Client ID: SW EFFLUENT
Sample Location: VA
Matrix: Water

Date Collected: 10/10/16 17:00
Date Received: 10/11/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	ND		mg/l	1.0	NA	1	-	10/14/16 01:55	121,2540D	MC
Chloride	290		mg/l	10	2.0	10	-	10/13/16 19:20	121,4500CL-E	ML
Nitrogen, Ammonia	1.35		mg/l	0.075	0.028	1	10/13/16 12:30	10/14/16 21:19	121,4500NH3-BH	AT
Total Organic Carbon	0.770		mg/l	0.500	0.114	1	-	10/17/16 11:01	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/15/16 08:00	10/15/16 09:00	74,1664A	KZ



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG941507-1									
Nitrogen, Ammonia	ND	mg/l	0.075	0.028	1	10/13/16 12:30	10/14/16 21:05	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG941868-1									
Chloride	ND	mg/l	1.0	0.20	1	-	10/13/16 18:50	121,4500CL-E	ML
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG941973-1									
Solids, Total Suspended	ND	mg/l	1.0	NA	1	-	10/14/16 01:55	121,2540D	MC
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG942441-1									
Oil & Grease, Hem-Grav	ND	mg/l	4.0	4.0	1	10/15/16 08:00	10/15/16 09:00	74,1664A	KZ
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG942636-1									
Total Organic Carbon	ND	mg/l	0.500	0.114	1	-	10/17/16 11:01	121,5310C	DW



Serial_No:10181611:17

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG941507-2								
Nitrogen, Ammonia	91		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG941868-2								
Chloride	97		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG942441-2								
Oil & Grease, Hem-Grav	95		-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG942636-2								
Total Organic Carbon	90		-		90-110	-		



Serial_No:10181611:17

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG941507-4 QC Sample: L1631988-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.267	4	4.10	96		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG941868-4 QC Sample: L1632435-01 Client ID: SW EFFLUENT												
Chloride	290	20	300	50	Q	-	-		58-140	-		7
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG942441-4 QC Sample: L1632429-01 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	40	35	87		-	-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG942636-4 QC Sample: L1632957-01 Client ID: MS Sample												
Total Organic Carbon	9.98	20	29.1	96		-	-		80-120	-		20



Serial_No:10181611:17

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG941507-3 QC Sample: L1631988-01 Client ID: DUP Sample						
Nitrogen, Ammonia	0.267	0.251	mg/l	6		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG941868-3 QC Sample: L1632435-01 Client ID: SW EFFLUENT						
Chloride	290	290	mg/l	0		7
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG941973-2 QC Sample: L1632239-01 Client ID: DUP Sample						
Solids, Total Suspended	210	210	mg/l	0		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG942441-3 QC Sample: L1632371-02 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG942636-3 QC Sample: L1632957-01 Client ID: DUP Sample						
Total Organic Carbon	9.98	9.77	mg/l	2		20



Project Name: DOMINION CHESTERFIELD**Lab Number:** L1632435**Project Number:** 14-3136**Report Date:** 10/18/16**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

Cooler Information Custody Seal**Cooler**

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1632435-01A	Amber 250ml H2SO4 preserved	A	N/A	3.9	Y	Absent	TOC-5310(28)
L1632435-01C	Plastic 500ml H2SO4 preserved	A	<2	3.9	Y	Absent	NH3-4500(28)
L1632435-01D	Plastic 500ml unpreserved	A	7	3.9	Y	Absent	CL-4500(28)
L1632435-01E	Plastic 950ml unpreserved	A	7	3.9	Y	Absent	TSS-2540-LOW(7)
L1632435-01F	Amber 1000ml HCl preserved	A	N/A	3.9	Y	Absent	OG-1664(28)
L1632435-01G	Amber 1000ml HCl preserved	A	N/A	3.9	Y	Absent	OG-1664(28)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1632435
Report Date: 10/18/16

REFERENCES

- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at its own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 <p>NEW JERSEY CHAIN OF CUSTODY</p> <p>Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193</p> <p>Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288</p>	<p>Service Centers</p> <p>Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105</p>	<p>Page 1 of 1</p>	<p>Date Rec'd In Lab 10/11/16</p>	<p>ALPHA Job # L1632435</p>																						
	<p>Project Information</p> <p>Project Name: <u>Domina Chesterfield</u> Project Location: <u>VA</u> Project # <u>14-3136</u></p>	<p>Deliverables</p> <p><input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> EQUIS (4 File) <input type="checkbox"/> Other</p>	<p>Billing Information</p> <p><input checked="" type="checkbox"/> Same as Client Info PO # <u>14-3136</u></p>																							
<p>Client Information</p> <p>Client: <u>GWT</u> Address: <u>627 NJ Hope Rd</u> <u>Wharton, NJ 07885</u> Phone: <u>973-983-0901</u> Fax: <u>973-983-0903</u> Email:</p>	<p>(Use Project name as Project #) <input type="checkbox"/></p> <p>Project Manager: <u>Rob Orlando</u> ALPHAQuote #: Turn-Around Time Standard <input checked="" type="checkbox"/> Due Date: Rush (only if pre approved) <input type="checkbox"/> # of Days:</p>	<p>Regulatory Requirement</p> <p><input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input type="checkbox"/> Other</p>	<p>Site Information</p> <p>Is this site impacted by Petroleum? Yes <input type="checkbox"/> Petroleum Product:</p>																							
<p>These samples have been previously analyzed by Alpha <input type="checkbox"/></p> <p>For EPH, selection is REQUIRED: <input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2</p>	<p>For VOC, selection is REQUIRED: <input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011</p>	<p>Other project specific requirements/comments: Please specify Metals or TAL.</p>	<p>ANALYSIS</p> <table border="1"> <tr> <td>TSS</td> <td>O+G/604</td> <td>Ammonia</td> <td>TOC</td> <td>Chloride</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	TSS	O+G/604	Ammonia	TOC	Chloride							X	X	X	X	X							<p>Sample Filtration</p> <p><input type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)</p>
TSS	O+G/604	Ammonia	TOC	Chloride																						
X	X	X	X	X																						
<p>ALPHA Lab ID (Lab Use Only)</p>	<p>Sample ID</p>	<p>Collection Date Time</p>	<p>Sample Matrix</p>	<p>Sampler's Initials</p>	<p>TSS</p>	<p>O+G/604</p>	<p>Ammonia</p>	<p>TOC</p>	<p>Chloride</p>	<p>Sample Specific Comments</p>																
32435-01	Sew Effluent	10/10/16 1700	USC	TEC	X	X	X	X	X																	



ANALYTICAL REPORT

Lab Number:	L1634447
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	14-3136
Report Date:	11/02/16

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:11021616:36

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1634447-01	INFLUENT 102516	WATER	VA	10/25/16 18:00	10/26/16
L1634447-02	EFFLUENT 102516	WATER	VA	10/25/16 18:00	10/26/16

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Per client request, the samples were analyzed for Trivalent and Hexavalent Chromium.

Sample Receipt

The sample collection times were specified by the client.

Total Organic Carbon

L1634447-02: The sample has an elevated detection limit due to the dilution required by the sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Lura L Troy

Title: Technical Director/Representative

Date: 11/02/16

METALS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

SAMPLE RESULTS

Lab ID: L1634447-01
 Client ID: INFLUENT 102516
 Sample Location: VA
 Matrix: Water

Date Collected: 10/25/16 18:00
 Date Received: 10/26/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0100		mg/l	0.0040	0.0004	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Arsenic, Total	0.0683		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Cadmium, Total	0.0002	J	mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Chromium, Total	0.0053		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Copper, Total	0.0062		mg/l	0.0010	0.0004	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Iron, Total	0.581		mg/l	0.050	0.009	1	10/28/16 13:45	10/31/16 19:20	EPA 3005A	19,200.7	AB
Lead, Total	0.0035		mg/l	0.0010	0.0003	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/28/16 09:53	10/28/16 17:34	EPA 245.1	3,245.1	EA
Nickel, Total	0.0164		mg/l	0.0020	0.0006	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Selenium, Total	0.0359		mg/l	0.0050	0.0017	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.0004	0.0003	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Thallium, Total	0.0008	J	mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV
Zinc, Total	0.0419		mg/l	0.0100	0.0034	1	10/28/16 13:45	10/29/16 09:46	EPA 3005A	3,200.8	BV

General Chemistry - Mansfield Lab

Chromium, Trivalent	ND		mg/l	0.010	0.010	1		10/29/16 09:46	NA	107,-	
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Dissolved Metals - Mansfield Lab

Antimony, Dissolved	0.0135		mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0631		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	0.0003	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0035		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0008	J	mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Iron, Dissolved	0.02	J	mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 15:49	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	10/31/16 14:36	10/31/16 20:08	EPA 245.1	3,245.1	EA
Nickel, Dissolved	0.0106		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Selenium, Dissolved	0.0358		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM
Thallium, Dissolved	0.0007	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD**Lab Number:** L1634447**Project Number:** 14-3136**Report Date:** 11/02/16**SAMPLE RESULTS**

Lab ID: L1634447-01

Date Collected: 10/25/16 18:00

Client ID: INFLUENT 102516

Date Received: 10/26/16

Sample Location: VA

Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Zinc, Dissolved	0.0359		mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:18	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

SAMPLE RESULTS

Lab ID: L1634447-02
 Client ID: EFFLUENT 102516
 Sample Location: VA
 Matrix: Water

Date Collected: 10/25/16 18:00
 Date Received: 10/26/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0005	J	mg/l	0.0040	0.0004	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Arsenic, Total	0.0016		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Chromium, Total	0.0004	J	mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Copper, Total	0.0004	J	mg/l	0.0010	0.0004	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Iron, Total	0.101		mg/l	0.050	0.009	1	10/28/16 13:45	10/31/16 19:24	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0003	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/28/16 09:53	10/28/16 17:51	EPA 245.1	3,245.1	EA
Nickel, Total	ND		mg/l	0.0020	0.0006	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Selenium, Total	ND		mg/l	0.0050	0.0017	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.0004	0.0003	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV
Zinc, Total	0.0250		mg/l	0.0100	0.0034	1	10/28/16 13:45	10/29/16 09:49	EPA 3005A	3,200.8	BV

General Chemistry - Mansfield Lab

Chromium, Trivalent	ND		mg/l	0.010	0.010	1		10/29/16 09:49	NA	107,-	
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Dissolved Metals - Mansfield Lab

Antimony, Dissolved	0.0009	J	mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0013		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0004	J	mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 16:06	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Mercury, Dissolved	0.00032		mg/l	0.00020	0.00006	1	10/31/16 14:36	10/31/16 20:18	EPA 245.1	3,245.1	EA
Nickel, Dissolved	ND		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM
Thallium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

SAMPLE RESULTS

Lab ID: L1634447-02
 Client ID: EFFLUENT 102516
 Sample Location: VA
 Matrix: Water

Date Collected: 10/25/16 18:00
 Date Received: 10/26/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Zinc, Dissolved	0.0114		mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:22	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG946757-1									
Mercury, Total	ND	mg/l	0.0002	0.0001	1	10/28/16 09:53	10/28/16 17:25	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst	
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG946894-1										
Antimony, Total	0.0011	J	mg/l	0.0040	0.0004	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Arsenic, Total	ND		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Chromium, Total	ND		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Copper, Total	ND		mg/l	0.0010	0.0004	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Lead, Total	ND		mg/l	0.0010	0.0003	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Nickel, Total	ND		mg/l	0.0020	0.0006	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Selenium, Total	ND		mg/l	0.0050	0.0017	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Silver, Total	ND		mg/l	0.0004	0.0003	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Zinc, Total	ND		mg/l	0.0100	0.0034	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst	
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG946896-1										
Iron, Total	ND		mg/l	0.050	0.009	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947603-1										
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	10/31/16 14:36	10/31/16 20:04	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947802-1										
Antimony, Dissolved	0.0016	J	mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Copper, Dissolved	0.00196	J	mg/l	0.00200	0.00038	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Thallium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947804-1										
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH

Prep Information

Digestion Method: EPA 3005A



Serial_No:11021616:36

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG946757-2								
Mercury, Total	99		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG946894-2								
Antimony, Total	103		-		85-115	-		
Arsenic, Total	98		-		85-115	-		
Cadmium, Total	111		-		85-115	-		
Chromium, Total	98		-		85-115	-		
Copper, Total	103		-		85-115	-		
Lead, Total	106		-		85-115	-		
Nickel, Total	98		-		85-115	-		
Selenium, Total	103		-		85-115	-		
Silver, Total	110		-		85-115	-		
Thallium, Total	103		-		85-115	-		
Zinc, Total	105		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG946896-2								
Iron, Total	93		-		85-115	-		
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947603-2								
Mercury, Dissolved	106		-		85-115	-		



Serial_No:11021616:36

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947802-2					
Antimony, Dissolved	91	-	85-115	-	
Arsenic, Dissolved	102	-	85-115	-	
Cadmium, Dissolved	99	-	85-115	-	
Chromium, Dissolved	95	-	85-115	-	
Copper, Dissolved	97	-	85-115	-	
Lead, Dissolved	110	-	85-115	-	
Nickel, Dissolved	96	-	85-115	-	
Selenium, Dissolved	94	-	85-115	-	
Silver, Dissolved	96	-	85-115	-	
Thallium, Dissolved	102	-	85-115	-	
Zinc, Dissolved	95	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947804-2					
Iron, Dissolved	88	-	85-115	-	



Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946757-3 QC Sample: L1634099-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.0049	98		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946757-5 QC Sample: L1634447-01 Client ID: INFLUENT 102516												
Mercury, Total	ND	0.005	0.0045	90		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946894-3 QC Sample: L1634662-01 Client ID: MS Sample												
Antimony, Total	0.0124	0.5	0.5945	116		-	-		70-130	-		20
Arsenic, Total	0.0788	0.12	0.2282	124		-	-		70-130	-		20
Cadmium, Total	0.0004J	0.051	0.0586	115		-	-		70-130	-		20
Chromium, Total	0.0079	0.2	0.2040	98		-	-		70-130	-		20
Copper, Total	0.0046	0.25	0.2608	102		-	-		70-130	-		20
Lead, Total	0.0014	0.51	0.5400	106		-	-		70-130	-		20
Nickel, Total	0.0134	0.5	0.5370	105		-	-		70-130	-		20
Selenium, Total	0.0391	0.12	0.1695	109		-	-		70-130	-		20
Silver, Total	ND	0.05	0.0525	105		-	-		70-130	-		20
Thallium, Total	0.0008J	0.12	0.1244	104		-	-		70-130	-		20
Zinc, Total	0.0113	0.5	0.5428	106		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946896-3 QC Sample: L1634662-01 Client ID: MS Sample												
Iron, Total	0.290	1	1.27	98		-	-		75-125	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947603-3 QC Sample: L1634447-01 Client ID: INFLUENT 102516												
Mercury, Dissolved	ND	0.005	0.00467	94		-	-		75-125	-		20

Serial_No:11021616:36

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947802-3 QC Sample: L1634447-01 Client ID: INFLUENT 102516									
Antimony, Dissolved	0.0135	0.5	0.6406	125	-	-	70-130	-	20
Arsenic, Dissolved	0.0631	0.12	0.1867	103	-	-	70-130	-	20
Cadmium, Dissolved	0.0003J	0.051	0.0481	94	-	-	70-130	-	20
Chromium, Dissolved	0.0035	0.2	0.1932	95	-	-	70-130	-	20
Copper, Dissolved	0.0008J	0.25	0.2423	97	-	-	70-130	-	20
Lead, Dissolved	ND	0.51	0.5173	101	-	-	70-130	-	20
Nickel, Dissolved	0.0106	0.5	0.4671	91	-	-	70-130	-	20
Selenium, Dissolved	0.0358	0.12	0.1614	105	-	-	70-130	-	20
Silver, Dissolved	ND	0.05	0.0454	91	-	-	70-130	-	20
Thallium, Dissolved	0.0007J	0.12	0.1137	95	-	-	70-130	-	20
Zinc, Dissolved	0.0359	0.5	0.4961	92	-	-	70-130	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947804-3 QC Sample: L1634447-01 Client ID: INFLUENT 102516									
Iron, Dissolved	0.02J	1	0.94	94	-	-	75-125	-	20



Serial_No:11021616:36

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946757-4 QC Sample: L1634099-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946757-6 QC Sample: L1634447-01 Client ID: INFLUENT 102516						
Mercury, Total	ND	0.0001J	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946894-4 QC Sample: L1634662-01 Client ID: DUP Sample						
Antimony, Total	0.0124	0.0109	mg/l	13		20
Arsenic, Total	0.0788	0.0788	mg/l	0		20
Cadmium, Total	0.0004J	0.0004J	mg/l	NC		20
Chromium, Total	0.0079	0.0083	mg/l	5		20
Copper, Total	0.0046	0.0042	mg/l	9		20
Lead, Total	0.0014	0.0015	mg/l	4		20
Nickel, Total	0.0134	0.0146	mg/l	9		20
Selenium, Total	0.0391	0.0381	mg/l	3		20
Silver, Total	ND	ND	mg/l	NC		20
Thallium, Total	0.0008J	0.0008J	mg/l	NC		20
Zinc, Total	0.0113	0.0116	mg/l	3		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946896-4 QC Sample: L1634662-01 Client ID: DUP Sample						
Iron, Total	0.290	0.290	mg/l	0		20



Serial_No:11021616:36

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947603-4 QC Sample: L1634447-01 Client ID: INFLUENT 102516					
Mercury, Dissolved	ND	0.00012J	mg/l	NC	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947802-4 QC Sample: L1634447-01 Client ID: INFLUENT 102516					
Antimony, Dissolved	0.0135	0.0126	mg/l	7	20
Arsenic, Dissolved	0.0631	0.0626	mg/l	1	20
Cadmium, Dissolved	0.0003J	0.0003J	mg/l	NC	20
Chromium, Dissolved	0.0035	0.0035	mg/l	0	20
Copper, Dissolved	0.0008J	0.0009J	mg/l	NC	20
Lead, Dissolved	ND	ND	mg/l	NC	20
Nickel, Dissolved	0.0106	0.0110	mg/l	4	20
Selenium, Dissolved	0.0358	0.0384	mg/l	7	20
Silver, Dissolved	ND	ND	mg/l	NC	20
Thallium, Dissolved	0.0007J	0.0007J	mg/l	NC	20
Zinc, Dissolved	0.0359	0.0368	mg/l	2	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947804-4 QC Sample: L1634447-01 Client ID: INFLUENT 102516					
Iron, Dissolved	0.02J	0.02J	mg/l	NC	20



INORGANICS & MISCELLANEOUS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

SAMPLE RESULTS

Lab ID: L1634447-01
Client ID: INFLUENT 102516
Sample Location: VA
Matrix: Water

Date Collected: 10/25/16 18:00
Date Received: 10/26/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	47.		mg/l	1.0	NA	1	-	10/28/16 02:00	121,2540D	MC
Chloride	140		mg/l	10	2.0	10	-	10/28/16 20:42	121,4500CL-E	ML
Nitrogen, Ammonia	0.778		mg/l	0.075	0.028	1	10/26/16 23:30	10/27/16 22:03	121,4500NH3-BH	AT
Total Organic Carbon	1.30		mg/l	1.00	0.228	2	-	10/27/16 07:07	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/28/16 20:00	10/28/16 22:00	74,1664A	ML
Chromium, Hexavalent	0.003	J	mg/l	0.010	0.003	1	10/26/16 15:00	10/26/16 15:17	1,7196A	LH



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

SAMPLE RESULTS

Lab ID: L1634447-02
Client ID: EFFLUENT 102516
Sample Location: VA
Matrix: Water

Date Collected: 10/25/16 18:00
Date Received: 10/26/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	5.9		mg/l	1.0	NA	1	-	10/28/16 02:00	121,2540D	MC
Chloride	97.		mg/l	10	2.0	10	-	10/28/16 20:46	121,4500CL-E	ML
Nitrogen, Ammonia	0.402		mg/l	0.075	0.028	1	10/26/16 23:30	10/27/16 22:04	121,4500NH3-BH	AT
Total Organic Carbon	0.990	J	mg/l	1.00	0.228	2	-	10/27/16 07:07	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/28/16 20:00	10/28/16 22:00	74,1664A	ML
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/16 15:00	10/26/16 15:17	1,7196A	LH



Project Name: DOMINION CHESTERFIELD

Lab Number: L1634447

Project Number: 14-3136

Report Date: 11/02/16

**Method Blank Analysis
Batch Quality Control**

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG946004-1										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/26/16 15:00	10/26/16 15:16	1,7196A	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG946185-1										
Nitrogen, Ammonia	ND		mg/l	0.075	0.028	1	10/26/16 23:30	10/27/16 21:51	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG946227-1										
Total Organic Carbon	ND		mg/l	0.500	0.114	1	-	10/27/16 07:07	121,5310C	DW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG946643-1										
Solids, Total Suspended	ND		mg/l	1.0	NA	1	-	10/28/16 02:00	121,2540D	MC
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG946958-1										
Chloride	0.22	J	mg/l	1.0	0.20	1	-	10/28/16 18:36	121,4500CL-E	ML
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG947012-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/28/16 20:00	10/28/16 22:00	74,1664A	ML



Serial_No:11021616:36

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG946004-2								
Chromium, Hexavalent	98		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG946185-2								
Nitrogen, Ammonia	94		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG946227-2								
Total Organic Carbon	101		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG946958-2								
Chloride	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG947012-2								
Oil & Grease, Hem-Grav	92		-		78-114	-		18



Serial_No:11021616:36

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MS Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG946004-4 QC Sample: L1634447-02 Client ID: EFFLUENT 102516												
Chromium, Hexavalent	ND	0.1	0.106	106	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG946185-4 QC Sample: L1633866-02 Client ID: MS Sample												
Nitrogen, Ammonia	7.00	4	10.9	98	-	-	-	-	80-120	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG946227-4 QC Sample: L1634277-01 Client ID: MS Sample												
Total Organic Carbon	11.0	20	31.7	104	-	-	-	-	80-120	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG946958-4 QC Sample: L1634804-02 Client ID: MS Sample												
Chloride	61.	20	77	80	-	-	-	-	58-140	-	-	7
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947012-4 QC Sample: L1634662-02 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	40	34	86	-	-	-	-	78-114	-	-	18



Serial_No:11021616:36

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG946004-3	QC Sample: L1634447-01	Client ID: INFLUENT 102516		
Chromium, Hexavalent	0.003J	0.003J	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG946185-3	QC Sample: L1633866-02	Client ID: DUP Sample		
Nitrogen, Ammonia	7.00	7.18	mg/l	3		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG946227-3	QC Sample: L1634277-01	Client ID: DUP Sample		
Total Organic Carbon	11.0	10.3	mg/l	7		20
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG946643-2	QC Sample: L1634358-02	Client ID: DUP Sample		
Solids, Total Suspended	2200	1700	mg/l	26		29
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG946958-3	QC Sample: L1634804-02	Client ID: DUP Sample		
Chloride	61.	58	mg/l	5		7
General Chemistry - Westborough Lab	Associated sample(s): 01-02	QC Batch ID: WG947012-3	QC Sample: L1634447-02	Client ID: EFFLUENT 102516		
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18



Project Name: DOMINION CHESTERFIELD

Lab Number: L1634447

Project Number: 14-3136

Report Date: 11/02/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1634447-01A	Vial H2SO4 preserved	A	N/A	3.3	Y	Absent	TOC-5310(28)
L1634447-01B	Vial H2SO4 preserved	A	N/A	3.3	Y	Absent	TOC-5310(28)
L1634447-01B1	Vial H2SO4 preserved	A	N/A	3.3	Y	Absent	TOC-5310(28)
L1634447-01C	Plastic 500ml H2SO4 preserved	A	<2	3.3	Y	Absent	NH3-4500(28)
L1634447-01D	Plastic 250ml unpreserved	A	7	3.3	Y	Absent	HEXCR-7196(1),CL-4500(28),TRICR-CALC(1)
L1634447-01D1	Plastic 250ml unpreserved	A	7	3.3	Y	Absent	CL-4500(28)
L1634447-01E	Plastic 950ml unpreserved	A	7	3.3	Y	Absent	TSS-2540-LOW(7)
L1634447-01F	Amber 1000ml HCl preserved	A	N/A	3.3	Y	Absent	OG-1664(28)
L1634447-01G	Amber 1000ml HCl preserved	A	N/A	3.3	Y	Absent	OG-1664(28)
L1634447-01H	Plastic 250ml HNO3 preserved	A	<2	3.3	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1634447-01I	Plastic 250ml unpreserved	A	7	3.3	Y	Absent	-
L1634447-01X	Plastic 120ml HNO3 preserved spl	A	<2	3.3	Y	Absent	AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1634447-02A	Vial H2SO4 preserved	A	N/A	3.3	Y	Absent	TOC-5310(28)
L1634447-02B	Vial H2SO4 preserved	A	N/A	3.3	Y	Absent	TOC-5310(28)
L1634447-02B1	Vial H2SO4 preserved	A	N/A	3.3	Y	Absent	TOC-5310(28)
L1634447-02C	Plastic 500ml H2SO4 preserved	A	<2	3.3	Y	Absent	NH3-4500(28)
L1634447-02D	Plastic 250ml unpreserved	A	7	3.3	Y	Absent	HEXCR-7196(1),CL-4500(28),TRICR-CALC(1)
L1634447-02D1	Plastic 250ml unpreserved	A	7	3.3	Y	Absent	CL-4500(28)
L1634447-02E	Plastic 950ml unpreserved	A	7	3.3	Y	Absent	TSS-2540-LOW(7)
L1634447-02F	Amber 1000ml HCl preserved	A	N/A	3.3	Y	Absent	OG-1664(28)
L1634447-02G	Amber 1000ml HCl preserved	A	N/A	3.3	Y	Absent	OG-1664(28)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD**Project Number:** 14-3136**Lab Number:** L1634447**Report Date:** 11/02/16**Container Information**

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1634447-02H	Plastic 250ml HNO3 preserved	A	<2	3.3	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1634447-02I	Plastic 250ml unpreserved	A	7	3.3	Y	Absent	-
L1634447-02X	Plastic 120ml HNO3 preserved spl	A	<2	3.3	Y	Absent	AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634447
Report Date: 11/02/16

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.
- 107 Alpha Analytical - In-house calculation method.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 NEW JERSEY CHAIN OF CUSTODY		Service Centers Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105		Page 1 of 1	Date Rec'd in Lab 10/26/16	ALPHA Job # L163447							
Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193		Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288		Project Information Project Name: <u>DOMINION CHESTERFIELD</u> Project Location: <u>VA</u> Project # <u>14-312</u> (Use Project name as Project #) <input type="checkbox"/>		Deliverables <input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> EQUIS (4 File) <input type="checkbox"/> Other							
Client Information Client: <u>GWTI</u> Address: <u>622 Mt Hope Rd</u> <u>Windsor VA 22885</u> Phone: <u>973-983-0901</u> Fax: <u>973-983-0903</u> Email: <u>gclaw@equittile.com</u>		Project Manager: <u>JIM CARLSON</u> ALPQuote #: Turn-Around Time: Standard <input type="checkbox"/> Due Date: Rush (only if pre approved) <input type="checkbox"/> # of Days:		Billing Information <input checked="" type="checkbox"/> Same as Client Info PO #									
For EPH, selection is REQUIRED: <input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2		For VOC, selection is REQUIRED: <input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011		Other project specific requirements/comments: <u>Metals by 200.8</u> <u>Please specify Metals or TAL.</u> <u>Sb, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Tl, Zn</u>		Regulatory Requirement <input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input checked="" type="checkbox"/> Other <u>VADEQ</u>							
ALPHA Lab ID (Lab Use Only)		Sample ID		Collection Date Time		Sample Matrix Sampler's Initials		ANALYSIS TOC AMMONIA CHLORIDE TSS TOTAL METALS DISSOLVED METALS OTHER METALS		Sample Filtration <input type="checkbox"/> Done <input checked="" type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)			
3447-01 02		INFLUENT 102516 EFFLUENT 102516		10/25/16 10/25/16		WW WW		RSD RSD		X X X X X X X X X X X X X X		10 10	
Preservative Code: A = None B = HCl C = HNO ₃ D = H ₂ SO ₄ E = NaOH F = MeOH G = NaHSO ₄ H = Na ₂ S ₂ O ₃ K/E = Zn Ac/NaOH O = Other		Container Code: P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle		Westboro: Certification No: MA935 Mansfield: Certification No: MA015		Container Type V P P P P P P A		Preservative D D A A C A B		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)			
Form No: 01-14 HC (rev. 30-Sept-2013)		Relinquished By: <u>[Signature]</u> (RSD)		Date/Time: <u>10/25/16 1500</u>		Received By: <u>[Signature]</u> AAR		Date/Time: <u>10/26/16 1012</u>					

FedEx Package
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City **WHARTON**
State **NJ** ZIP **07885-2807**
Dept./Floor/Suite/Room

Phone 973 983-0501

2 Your Internal Billing Reference

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State **MA** ZIP **01581**
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City **WEST BOROUGH**
State **MA** ZIP **01581**
Dept./Floor/Suite/Room

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ANALYTICAL REPORT

Lab Number:	L1634662
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	14-3136
Report Date:	11/04/16

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Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:11041615:29

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1634662-01	INFLUENT 102616	WATER	VA	10/26/16 18:00	10/27/16
L1634662-02	EFLLUENT 102616	WATER	VA	10/26/16 18:00	10/27/16

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Metals

The WG946896-3 MS recovery for calcium (137%), performed on L1634662-01, does not apply because the sample concentration is greater than four times the spike amount added.

Nitrogen, Ammonia

The Effluent (L1634662-02) result is greater than the Influent (L1634662-02) result. The results were verified.

Chromium, Hexavalent

The WG946502-4 MS recovery (116%), performed on L1634662-01, is outside the acceptance criteria; however, the associated LCS recovery is within criteria. No further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 11/04/16

METALS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634662-01
 Client ID: INFLUENT 102616
 Sample Location: VA
 Matrix: Water

Date Collected: 10/26/16 18:00
 Date Received: 10/27/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.8360		mg/l	0.0100	0.0033	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Antimony, Total	0.0124		mg/l	0.0040	0.0004	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Arsenic, Total	0.0788		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Beryllium, Total	0.0004	J	mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Boron, Total	1.68		mg/l	0.030	0.002	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Cadmium, Total	0.0004	J	mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Calcium, Total	95.3		mg/l	0.100	0.035	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Chromium, Total	0.0079		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Cobalt, Total	0.003	J	mg/l	0.020	0.002	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Copper, Total	0.0046		mg/l	0.0010	0.0004	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Iron, Total	0.290		mg/l	0.050	0.009	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Lead, Total	0.0014		mg/l	0.0010	0.0003	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Magnesium, Total	9.75		mg/l	0.100	0.015	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/31/16 15:55	11/01/16 20:14	EPA 245.1	3,245.1	EA
Molybdenum, Total	0.108		mg/l	0.050	0.004	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Nickel, Total	0.0134		mg/l	0.0020	0.0006	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Potassium, Total	7.75		mg/l	2.50	0.237	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Selenium, Total	0.0391		mg/l	0.0050	0.0017	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.0004	0.0003	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Sodium, Total	55.7		mg/l	2.00	0.120	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Thallium, Total	0.0008	J	mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV
Vanadium, Total	0.056		mg/l	0.010	0.002	1	10/28/16 13:45	10/31/16 18:23	EPA 3005A	19,200.7	AB
Zinc, Total	0.0113		mg/l	0.0100	0.0034	1	10/28/16 13:45	10/29/16 09:36	EPA 3005A	3,200.8	BV

General Chemistry - Mansfield Lab

Chromium, Trivalent	ND		mg/l	0.010	0.010	1		10/29/16 09:36	NA	107,-	
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Dissolved Metals - Mansfield Lab

Aluminum, Dissolved	0.2080		mg/l	0.0100	0.0033	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Antimony, Dissolved	0.0117		mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634662-01
Client ID: INFLUENT 102616
Sample Location: VA
Matrix: Water

Date Collected: 10/26/16 18:00
Date Received: 10/27/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Arsenic, Dissolved	0.0686		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Beryllium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Boron, Dissolved	1.70		mg/l	0.030	0.002	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Cadmium, Dissolved	0.0003	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Calcium, Dissolved	100		mg/l	0.10	0.04	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Chromium, Dissolved	0.0069		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Cobalt, Dissolved	0.002	J	mg/l	0.020	0.002	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Copper, Dissolved	0.0008	J	mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Magnesium, Dissolved	9.6		mg/l	0.10	0.02	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:21	EPA 245.1	3,245.1	EA
Molybdenum, Dissolved	0.12		mg/l	0.05	0.004	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Nickel, Dissolved	0.0138		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Potassium, Dissolved	8.0		mg/l	2.5	0.24	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Selenium, Dissolved	0.0379		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Sodium, Dissolved	59		mg/l	2.0	0.12	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Thallium, Dissolved	0.0007	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM
Vanadium, Dissolved	0.054		mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 16:32	EPA 3005A	19,200.7	JH
Zinc, Dissolved	0.0070	J	mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:25	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634662-02
 Client ID: EFLLUENT 102616
 Sample Location: VA
 Matrix: Water

Date Collected: 10/26/16 18:00
 Date Received: 10/27/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.3583		mg/l	0.0100	0.0033	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Antimony, Total	0.0005	J	mg/l	0.0040	0.0004	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Arsenic, Total	ND		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Beryllium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Boron, Total	0.435		mg/l	0.030	0.002	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Calcium, Total	79.2		mg/l	0.100	0.035	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Chromium, Total	0.0005	J	mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Cobalt, Total	ND		mg/l	0.020	0.002	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Copper, Total	ND		mg/l	0.0010	0.0004	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Iron, Total	ND		mg/l	0.050	0.009	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Lead, Total	ND		mg/l	0.0010	0.0003	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Magnesium, Total	5.78		mg/l	0.100	0.015	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/31/16 15:55	11/01/16 20:16	EPA 245.1	3,245.1	EA
Molybdenum, Total	ND		mg/l	0.050	0.004	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Nickel, Total	0.0009	J	mg/l	0.0020	0.0006	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Potassium, Total	6.92		mg/l	2.50	0.237	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Selenium, Total	0.0439		mg/l	0.0050	0.0017	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.0004	0.0003	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Sodium, Total	53.9		mg/l	2.00	0.120	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV
Vanadium, Total	ND		mg/l	0.010	0.002	1	10/28/16 13:45	10/31/16 19:28	EPA 3005A	19,200.7	AB
Zinc, Total	ND		mg/l	0.0100	0.0034	1	10/28/16 13:45	10/29/16 10:04	EPA 3005A	3,200.8	BV

General Chemistry - Mansfield Lab

Chromium, Trivalent	ND		mg/l	0.010	0.010	1		10/29/16 10:04	NA	107,-	
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Dissolved Metals - Mansfield Lab

Aluminum, Dissolved	0.3908		mg/l	0.0100	0.0033	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Antimony, Dissolved	0.0005	J	mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634662-02
Client ID: EFLLUENT 102616
Sample Location: VA
Matrix: Water

Date Collected: 10/26/16 18:00
Date Received: 10/27/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Arsenic, Dissolved	0.0003	J	mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Beryllium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Boron, Dissolved	0.438		mg/l	0.030	0.002	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Cadmium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Calcium, Dissolved	84		mg/l	0.10	0.04	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Chromium, Dissolved	0.0002	J	mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Cobalt, Dissolved	ND		mg/l	0.020	0.002	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Copper, Dissolved	ND		mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Magnesium, Dissolved	5.6		mg/l	0.10	0.02	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:27	EPA 245.1	3,245.1	EA
Molybdenum, Dissolved	ND		mg/l	0.05	0.004	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Nickel, Dissolved	0.0006	J	mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Potassium, Dissolved	7.3		mg/l	2.5	0.24	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Selenium, Dissolved	0.0431		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Sodium, Dissolved	56		mg/l	2.0	0.12	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Thallium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM
Vanadium, Dissolved	ND		mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 16:11	EPA 3005A	19,200.7	JH
Zinc, Dissolved	ND		mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:28	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG946894-1										
Aluminum, Total	ND		mg/l	0.0100	0.0033	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Antimony, Total	0.0011	J	mg/l	0.0040	0.0004	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Arsenic, Total	ND		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Beryllium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Chromium, Total	ND		mg/l	0.0010	0.0002	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Copper, Total	ND		mg/l	0.0010	0.0004	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Lead, Total	ND		mg/l	0.0010	0.0003	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Nickel, Total	ND		mg/l	0.0020	0.0006	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Selenium, Total	ND		mg/l	0.0050	0.0017	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Silver, Total	ND		mg/l	0.0004	0.0003	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Thallium, Total	ND		mg/l	0.0010	0.0001	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV
Zinc, Total	ND		mg/l	0.0100	0.0034	1	10/28/16 13:45	10/29/16 09:24	3,200.8	BV

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG946896-1										
Boron, Total	ND		mg/l	0.030	0.002	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB
Calcium, Total	ND		mg/l	0.100	0.035	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB
Cobalt, Total	ND		mg/l	0.020	0.002	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB
Iron, Total	ND		mg/l	0.050	0.009	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB
Magnesium, Total	ND		mg/l	0.100	0.015	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB
Molybdenum, Total	ND		mg/l	0.050	0.004	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB
Potassium, Total	ND		mg/l	2.50	0.237	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB
Sodium, Total	ND		mg/l	2.00	0.120	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB
Vanadium, Total	ND		mg/l	0.010	0.002	1	10/28/16 13:45	10/31/16 18:11	19,200.7	AB



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Method Blank Analysis Batch Quality Control

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947637-1										
Mercury, Total	ND		mg/l	0.00020	0.00006	1	10/31/16 15:55	11/01/16 20:01	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947802-1										
Aluminum, Dissolved	0.0046	J	mg/l	0.0100	0.0033	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Antimony, Dissolved	0.0016	J	mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Beryllium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Copper, Dissolved	0.00196	J	mg/l	0.00200	0.00038	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Thallium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947804-1									
Calcium, Dissolved	ND	mg/l	0.10	0.04	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Cobalt, Dissolved	ND	mg/l	0.020	0.002	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Iron, Dissolved	ND	mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Magnesium, Dissolved	ND	mg/l	0.10	0.02	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Molybdenum, Dissolved	ND	mg/l	0.05	0.004	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Potassium, Dissolved	ND	mg/l	2.5	0.24	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Sodium, Dissolved	ND	mg/l	2.0	0.12	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Vanadium, Dissolved	ND	mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947965-1									
Mercury, Dissolved	ND	mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:17	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1



Serial_No:11041615:29

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG946894-2								
Aluminum, Total	95		-		85-115	-		
Antimony, Total	103		-		85-115	-		
Arsenic, Total	98		-		85-115	-		
Beryllium, Total	98		-		85-115	-		
Cadmium, Total	111		-		85-115	-		
Chromium, Total	98		-		85-115	-		
Copper, Total	103		-		85-115	-		
Lead, Total	106		-		85-115	-		
Nickel, Total	98		-		85-115	-		
Selenium, Total	103		-		85-115	-		
Silver, Total	110		-		85-115	-		
Thallium, Total	103		-		85-115	-		
Zinc, Total	105		-		85-115	-		



Serial_No:11041615:29

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG946896-2					
Boron, Total	107	-	85-115	-	
Calcium, Total	95	-	85-115	-	
Cobalt, Total	98	-	85-115	-	
Iron, Total	93	-	85-115	-	
Magnesium, Total	108	-	85-115	-	
Molybdenum, Total	97	-	85-115	-	
Potassium, Total	98	-	85-115	-	
Sodium, Total	99	-	85-115	-	
Vanadium, Total	102	-	85-115	-	
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947637-2					
Mercury, Total	107	-	85-115	-	



Serial_No:11041615:29

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947802-2					
Aluminum, Dissolved	100	-	85-115	-	
Antimony, Dissolved	91	-	85-115	-	
Arsenic, Dissolved	102	-	85-115	-	
Beryllium, Dissolved	96	-	85-115	-	
Cadmium, Dissolved	99	-	85-115	-	
Chromium, Dissolved	95	-	85-115	-	
Copper, Dissolved	97	-	85-115	-	
Lead, Dissolved	110	-	85-115	-	
Nickel, Dissolved	96	-	85-115	-	
Selenium, Dissolved	94	-	85-115	-	
Silver, Dissolved	96	-	85-115	-	
Thallium, Dissolved	102	-	85-115	-	
Zinc, Dissolved	95	-	85-115	-	



Serial_No:11041615:29

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947804-2					
Calcium, Dissolved	99	-	85-115	-	
Cobalt, Dissolved	96	-	85-115	-	
Iron, Dissolved	88	-	85-115	-	
Magnesium, Dissolved	100	-	85-115	-	
Molybdenum, Dissolved	91	-	85-115	-	
Potassium, Dissolved	98	-	85-115	-	
Sodium, Dissolved	100	-	85-115	-	
Vanadium, Dissolved	98	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947965-2					
Mercury, Dissolved	95	-	85-115	-	



Serial_No:11041615:29

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946894-3 QC Sample: L1634662-01 Client ID: INFLUENT 102616												
Aluminum, Total	0.8360	2	2.913	104		-	-		70-130	-		20
Antimony, Total	0.0124	0.5	0.5945	116		-	-		70-130	-		20
Arsenic, Total	0.0788	0.12	0.2282	124		-	-		70-130	-		20
Beryllium, Total	0.0004J	0.05	0.0492	98		-	-		70-130	-		20
Cadmium, Total	0.0004J	0.051	0.0586	115		-	-		70-130	-		20
Chromium, Total	0.0079	0.2	0.2040	98		-	-		70-130	-		20
Copper, Total	0.0046	0.25	0.2608	102		-	-		70-130	-		20
Lead, Total	0.0014	0.51	0.5400	106		-	-		70-130	-		20
Nickel, Total	0.0134	0.5	0.5370	105		-	-		70-130	-		20
Selenium, Total	0.0391	0.12	0.1695	109		-	-		70-130	-		20
Silver, Total	ND	0.05	0.0525	105		-	-		70-130	-		20
Thallium, Total	0.0008J	0.12	0.1244	104		-	-		70-130	-		20
Zinc, Total	0.0113	0.5	0.5428	106		-	-		70-130	-		20



Serial_No:11041615:29

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946896-3 QC Sample: L1634662-01 Client ID: INFLUENT 102616									
Boron, Total	1.68	1	2.81	113	-	-	75-125	-	20
Calcium, Total	95.3	10	109	137	Q	-	75-125	-	20
Cobalt, Total	0.003J	0.5	0.496	99	-	-	75-125	-	20
Iron, Total	0.290	1	1.27	98	-	-	75-125	-	20
Magnesium, Total	9.75	10	20.6	108	-	-	75-125	-	20
Molybdenum, Total	0.108	1	1.11	100	-	-	75-125	-	20
Potassium, Total	7.75	10	18.4	106	-	-	75-125	-	20
Sodium, Total	55.7	10	68.2	125	-	-	75-125	-	20
Vanadium, Total	0.056	0.5	0.582	105	-	-	75-125	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947637-3 QC Sample: L1634832-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.00483	97	-	-	70-130	-	20



Serial_No:11041615:29

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947802-3 QC Sample: L1634447-01 Client ID: MS Sample									
Aluminum, Dissolved	0.1624	2	2.073	96	-	-	70-130	-	20
Antimony, Dissolved	0.0135	0.5	0.6406	125	-	-	70-130	-	20
Arsenic, Dissolved	0.0631	0.12	0.1867	103	-	-	70-130	-	20
Beryllium, Dissolved	ND	0.05	0.0494	99	-	-	70-130	-	20
Cadmium, Dissolved	0.0003J	0.051	0.0481	94	-	-	70-130	-	20
Chromium, Dissolved	0.0035	0.2	0.1932	95	-	-	70-130	-	20
Copper, Dissolved	0.0008J	0.25	0.2423	97	-	-	70-130	-	20
Lead, Dissolved	ND	0.51	0.5173	101	-	-	70-130	-	20
Nickel, Dissolved	0.0106	0.5	0.4671	91	-	-	70-130	-	20
Selenium, Dissolved	0.0358	0.12	0.1614	105	-	-	70-130	-	20
Silver, Dissolved	ND	0.05	0.0454	91	-	-	70-130	-	20
Thallium, Dissolved	0.0007J	0.12	0.1137	95	-	-	70-130	-	20
Zinc, Dissolved	0.0359	0.5	0.4961	92	-	-	70-130	-	20



Serial_No:11041615:29

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947804-3 QC Sample: L1634447-01 Client ID: MS Sample									
Calcium, Dissolved	90.	10	100	100	-	-	75-125	-	20
Cobalt, Dissolved	0.003J	0.5	0.482	96	-	-	75-125	-	20
Iron, Dissolved	0.02J	1	0.94	94	-	-	75-125	-	20
Magnesium, Dissolved	9.1	10	19	99	-	-	75-125	-	20
Molybdenum, Dissolved	0.12	1	1.1	98	-	-	75-125	-	20
Potassium, Dissolved	7.1	10	16	89	-	-	75-125	-	20
Sodium, Dissolved	50.	10	60	100	-	-	75-125	-	20
Vanadium, Dissolved	0.052	0.5	0.551	100	-	-	75-125	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947965-3 QC Sample: L1634662-01 Client ID: INFLUENT 102616									
Mercury, Dissolved	ND	0.005	0.00426	85	-	-	75-125	-	20



Serial_No:11041615:29

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946894-4 QC Sample: L1634662-01 Client ID: INFLUENT 102616						
Aluminum, Total	0.8360	0.8381	mg/l	0		20
Antimony, Total	0.0124	0.0109	mg/l	13		20
Arsenic, Total	0.0788	0.0788	mg/l	0		20
Beryllium, Total	0.0004J	0.0004J	mg/l	NC		20
Cadmium, Total	0.0004J	0.0004J	mg/l	NC		20
Chromium, Total	0.0079	0.0083	mg/l	5		20
Copper, Total	0.0046	0.0042	mg/l	9		20
Lead, Total	0.0014	0.0015	mg/l	4		20
Nickel, Total	0.0134	0.0146	mg/l	9		20
Selenium, Total	0.0391	0.0381	mg/l	3		20
Silver, Total	ND	ND	mg/l	NC		20
Thallium, Total	0.0008J	0.0008J	mg/l	NC		20
Zinc, Total	0.0113	0.0116	mg/l	3		20



Serial_No:11041615:29

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG946896-4 QC Sample: L1634662-01 Client ID: INFLUENT 102616					
Boron, Total	1.68	1.72	mg/l	2	20
Calcium, Total	95.3	98.6	mg/l	3	20
Cobalt, Total	0.003J	0.003J	mg/l	NC	20
Iron, Total	0.290	0.290	mg/l	0	20
Magnesium, Total	9.75	10.1	mg/l	4	20
Molybdenum, Total	0.108	0.110	mg/l	2	20
Potassium, Total	7.75	8.00	mg/l	3	20
Sodium, Total	55.7	57.5	mg/l	3	20
Vanadium, Total	0.056	0.058	mg/l	2	20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947637-4 QC Sample: L1634832-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20



Serial_No:11041615:29

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947802-4 QC Sample: L1634447-01 Client ID: DUP Sample					
Antimony, Dissolved	0.0135	0.0126	mg/l	7	20
Arsenic, Dissolved	0.0631	0.0626	mg/l	1	20
Cadmium, Dissolved	0.0003J	0.0003J	mg/l	NC	20
Chromium, Dissolved	0.0035	0.0035	mg/l	0	20
Copper, Dissolved	0.0008J	0.0009J	mg/l	NC	20
Lead, Dissolved	ND	ND	mg/l	NC	20
Nickel, Dissolved	0.0106	0.0110	mg/l	4	20
Selenium, Dissolved	0.0358	0.0384	mg/l	7	20
Silver, Dissolved	ND	ND	mg/l	NC	20
Thallium, Dissolved	0.0007J	0.0007J	mg/l	NC	20
Zinc, Dissolved	0.0359	0.0368	mg/l	2	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947804-4 QC Sample: L1634447-01 Client ID: DUP Sample					
Iron, Dissolved	0.02J	0.02J	mg/l	NC	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947965-4 QC Sample: L1634662-01 Client ID: INFLUENT 102616					
Mercury, Dissolved	ND	ND	mg/l	NC	20



INORGANICS & MISCELLANEOUS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634662-01
Client ID: INFLUENT 102616
Sample Location: VA
Matrix: Water

Date Collected: 10/26/16 18:00
Date Received: 10/27/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	40.		mg/l	1.0	NA	1	-	10/30/16 14:25	121,2540D	SG
Chloride	150		mg/l	10	2.0	10	-	10/28/16 20:51	121,4500CL-E	ML
Nitrogen, Ammonia	0.193		mg/l	0.075	0.028	1	10/29/16 09:56	11/01/16 11:55	121,4500NH3-BH	JO
Total Organic Carbon	1.84		mg/l	1.00	0.228	2	-	10/31/16 07:16	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/28/16 20:00	10/28/16 22:00	74,1664A	ML
Chromium, Hexavalent	0.007	J	mg/l	0.010	0.003	1	10/27/16 14:55	10/27/16 15:09	1,7196A	LH



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634662-02
Client ID: EFLLUENT 102616
Sample Location: VA
Matrix: Water

Date Collected: 10/26/16 18:00
Date Received: 10/27/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	ND		mg/l	1.0	NA	1	-	10/30/16 14:25	121,2540D	SG
Chloride	160		mg/l	10	2.0	10	-	10/28/16 20:53	121,4500CL-E	ML
Nitrogen, Ammonia	0.805		mg/l	0.075	0.028	1	10/29/16 09:56	11/01/16 11:56	121,4500NH3-BH	JO
Total Organic Carbon	0.530		mg/l	0.500	0.114	1	-	10/31/16 07:16	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/28/16 20:00	10/28/16 22:00	74,1664A	ML
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/16 14:55	10/27/16 15:10	1,7196A	LH



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG946502-1										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/27/16 14:55	10/27/16 15:09	1,7196A	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG946958-1										
Chloride	0.22	J	mg/l	1.0	0.20	1	-	10/28/16 18:36	121,4500CL-E	ML
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG947012-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/28/16 20:00	10/28/16 22:00	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG947123-1										
Nitrogen, Ammonia	ND		mg/l	0.075	0.028	1	10/29/16 09:56	11/01/16 11:46	121,4500NH3-BH	JO
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG947306-1										
Solids, Total Suspended	ND		mg/l	1.0	NA	1	-	10/30/16 14:25	121,2540D	SG
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG947435-1										
Total Organic Carbon	ND		mg/l	0.500	0.114	1	-	10/31/16 07:16	121,5310C	DW



Serial_No:11041615:29

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG946502-2								
Chromium, Hexavalent	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG946958-2								
Chloride	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG947012-2								
Oil & Grease, Hem-Grav	92		-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG947123-2								
Nitrogen, Ammonia	96		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG947435-2								
Total Organic Carbon	97		-		90-110	-		



Serial_No:11041615:29

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG946502-4 QC Sample: L1634662-01 Client ID: INFLUENT 102616												
Chromium, Hexavalent	0.007J	0.1	0.116	116	Q	-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG946958-4 QC Sample: L1634804-02 Client ID: MS Sample												
Chloride	61.	20	77	80		-	-		58-140	-		7
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947012-4 QC Sample: L1634662-02 Client ID: EFFLUENT 102616												
Oil & Grease, Hem-Grav	ND	40	34	86		-	-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947123-4 QC Sample: L1634945-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.935	4	4.79	96		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947435-4 QC Sample: L1634945-02 Client ID: MS Sample												
Total Organic Carbon	2.17	4	5.52	84		-	-		80-120	-		20



Serial_No:11041615:29

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1634662
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG946502-3 QC Sample: L1634662-02 Client ID: EFLLUENT 102616						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG946958-3 QC Sample: L1634804-02 Client ID: DUP Sample						
Chloride	61.	58	mg/l	5		7
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947012-3 QC Sample: L1634447-02 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947123-3 QC Sample: L1634945-01 Client ID: DUP Sample						
Nitrogen, Ammonia	0.935	0.947	mg/l	1		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947306-2 QC Sample: L1634629-01 Client ID: DUP Sample						
Solids, Total Suspended	940	930	mg/l	1		29
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947435-3 QC Sample: L1634945-01 Client ID: DUP Sample						
Total Organic Carbon	3.71	3.74	mg/l	1		20



Project Name: DOMINION CHESTERFIELD

Lab Number: L1634662

Project Number: 14-3136

Report Date: 11/04/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1634662-01A	Vial H2SO4 preserved	A	N/A	2.8	Y	Absent	TOC-5310(28)
L1634662-01B	Vial H2SO4 preserved	A	N/A	2.8	Y	Absent	TOC-5310(28)
L1634662-01B1	Vial H2SO4 preserved	A	N/A	2.8	Y	Absent	TOC-5310(28)
L1634662-01C	Plastic 500ml H2SO4 preserved	A	<2	2.8	Y	Absent	NH3-4500(28)
L1634662-01D	Plastic 250ml unpreserved	A	7	2.8	Y	Absent	HEXCR-7196(1),CL-4500(28),TRICR-CALC(1)
L1634662-01D1	Plastic 250ml unpreserved	A	7	2.8	Y	Absent	CL-4500(28)
L1634662-01E	Plastic 950ml unpreserved	A	7	2.8	Y	Absent	TSS-2540-LOW(7)
L1634662-01F	Amber 1000ml HCl preserved	A	N/A	2.8	Y	Absent	OG-1664(28)
L1634662-01G	Amber 1000ml HCl preserved	A	N/A	2.8	Y	Absent	OG-1664(28)
L1634662-01H	Plastic 250ml HNO3 preserved	A	<2	2.8	Y	Absent	AL-2008T(180),CD-2008T(180),MO-UI(180),CA-UI(180),NI-2008T(180),BE-2008T(180),CO-UI(180),K-UI(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),MG-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),B-UI(180),NA-UI(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180),V-UI(180)
L1634662-01I	Plastic 250ml unpreserved	A	7	2.8	Y	Absent	-
L1634662-01X	Plastic 120ml HNO3 preserved spl	A	<2	2.8	Y	Absent	AG-2008S(180),CR-2008S(180),FE-RI(180),AL-2008S(180),BE-2008S(180),K-RI(180),B-RI(180),MG-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),CO-RI(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),CA-RI(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28),MO-RI(180),NA-RI(180),V-RI(180)
L1634662-02A	Vial H2SO4 preserved	A	N/A	2.8	Y	Absent	TOC-5310(28)
L1634662-02B	Vial H2SO4 preserved	A	N/A	2.8	Y	Absent	TOC-5310(28)
L1634662-02B1	Vial H2SO4 preserved	A	N/A	2.8	Y	Absent	TOC-5310(28)
L1634662-02C	Plastic 500ml H2SO4 preserved	A	<2	2.8	Y	Absent	NH3-4500(28)

*Values in parentheses indicate holding time in days

Project Name: DOMINION CHESTERFIELD

Project Number: 14-3136

Lab Number: L1634662

Report Date: 11/04/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1634662-02D	Plastic 250ml unpreserved	A	7	2.8	Y	Absent	HEXCR-7196(1),CL-4500(28),TRICR-CALC(1)
L1634662-02D1	Plastic 250ml unpreserved	A	7	2.8	Y	Absent	CL-4500(28)
L1634662-02E	Plastic 950ml unpreserved	A	7	2.8	Y	Absent	TSS-2540-LOW(7)
L1634662-02F	Amber 1000ml HCl preserved	A	N/A	2.8	Y	Absent	OG-1664(28)
L1634662-02G	Amber 1000ml HCl preserved	A	N/A	2.8	Y	Absent	OG-1664(28)
L1634662-02H	Plastic 250ml HNO3 preserved	A	<2	2.8	Y	Absent	AL-2008T(180),CD-2008T(180),MO-UI(180),CA-UI(180),NI-2008T(180),BE-2008T(180),CO-UI(180),K-UI(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),MG-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),B-UI(180),NA-UI(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180),V-UI(180)
L1634662-02I	Plastic 250ml unpreserved	A	7	2.8	Y	Absent	-
L1634662-02X	Plastic 120ml HNO3 preserved spl	A	<2	2.8	Y	Absent	AG-2008S(180),CR-2008S(180),FE-RI(180),AL-2008S(180),BE-2008S(180),K-RI(180),B-RI(180),MG-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),CO-RI(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),CA-RI(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28),MO-RI(180),NA-RI(180),V-RI(180)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634662
Report Date: 11/04/16

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.
- 107 Alpha Analytical - In-house calculation method.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 <p>NEW JERSEY CHAIN OF CUSTODY</p> <p>Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193</p> <p>Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288</p>	<p>Service Centers</p> <p>Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105</p>	<p>Page 1 of 1</p>	<p>Date Rec'd in Lab 10/27/16</p>	<p>ALPHA Job # L1634662</p>																										
	<p>Project Information</p> <p>Project Name: DOMINION CHESTERFIELD Project Location: VA Project # 14-3136</p>	<p>Deliverables</p> <p><input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQUiS (1 File) <input type="checkbox"/> EQUiS (4 File) <input type="checkbox"/> Other</p>	<p>Billing Information</p> <p><input checked="" type="checkbox"/> Same as Client Info PO #</p>																											
<p>Client Information</p> <p>Client: GWT Address: 627 Mt. Hope Rd Linton, NJ 07835 Phone: 973-983-0961 Fax: 973-983-0963 Email: carla@gtw.com</p>	<p>Project Manager: TIM CARLSON ALPHAQuote #:</p> <p>Turn-Around Time Standard <input type="checkbox"/> Due Date: Rush (only if pre approved) <input type="checkbox"/> # of Days:</p>	<p>Regulatory Requirement</p> <p><input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input checked="" type="checkbox"/> Other VADSG</p>	<p>Site Information</p> <p>Is this site impacted by Petroleum? Yes <input type="checkbox"/> Petroleum Product:</p>																											
<p>These samples have been previously analyzed by Alpha <input type="checkbox"/></p> <p>For EPH, selection is REQUIRED: <input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2</p>	<p>For VOC, selection is REQUIRED: <input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011</p>	<p>Other project specific requirements/comments: METALS by 200.8 K, Ca, Please specify Metals or TAL. Sb, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Mo, Be, Co, B, V, Al, Bi, Na, Mg, Ti, Zn</p>	<p>ANALYSIS</p> <table border="1"> <tr> <td>TOC</td> <td>AMMONIA</td> <td>CHLORIDE</td> <td>TSS</td> <td>TOTAL METALS</td> <td>DISSOLVED METALS</td> <td>OTG 1664</td> <td>Hex Cr</td> </tr> </table>	TOC	AMMONIA	CHLORIDE	TSS	TOTAL METALS	DISSOLVED METALS	OTG 1664	Hex Cr	<p>Sample Filtration</p> <p><input type="checkbox"/> Done <input checked="" type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)</p>																		
TOC	AMMONIA	CHLORIDE	TSS	TOTAL METALS	DISSOLVED METALS	OTG 1664	Hex Cr																							
<p>ALPHA Lab ID (Lab Use Only)</p>	<p>Sample ID</p>	<p>Collection Date Time</p>	<p>Sample Matrix</p>	<p>Sampler's Initials</p>	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>34662-01</td> <td>INFLUENT 102616</td> <td>10/26/16 1800</td> <td>WW</td> <td>RMO</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>02</td> <td>EFFLUENT 102616</td> <td>10/26/16 1800</td> <td>WW</td> <td>RMO</td> <td>X</td> <td>X</td> <td>X</td> </tr> </table>									34662-01	INFLUENT 102616	10/26/16 1800	WW	RMO	X	X	X	02	EFFLUENT 102616	10/26/16 1800	WW	RMO	X	X	X	<p>Sample Specific Comments</p>
34662-01	INFLUENT 102616	10/26/16 1800	WW	RMO	X	X	X																							
02	EFFLUENT 102616	10/26/16 1800	WW	RMO	X	X	X																							
<p>Preservative Code: A = None B = HCl C = HNO₃ D = H₂SO₄ E = NaOH F = MeOH G = NaHSO₄ H = Na₂S₂O₃ K/E = Zn Ac/NaOH O = Other</p>	<p>Container Code P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle</p>	<p>Westboro: Certification No: MA935 Mansfield: Certification No: MA015</p>	<p>Container Type V P P P P P A P Preservative D D A A C A B A</p>	<p>Relinquished By: [Signature] (RMO) Date/Time: 10/26/16 / RMO Received By: [Signature] AM Date/Time: 10/27/16</p>	<p>Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)</p>																									

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00100

FedEx Package Express **US Airbill**

FedEx Tracking Number **8029 9642 3063**

Form ID No. **0215** **SPH1** Recipient's Copy

1 From
 Date **10/26/16**
 Sender's Name **RO. ORLANDO** Phone **973 993-0901**
 Company **GROUNDWATER TREATMENT & TECH**
 Address **627 MOUNT HOPE RD**
 City **WHARTON** State **NJ** ZIP **07886-2907**

2 Your Internal Billing Reference **14-3136**

3 To
 Recipient's Name **SAMPLES RECEIVING** Phone **508 898-9226**
 Company **ALPHA ANALYTICAL**
 Address **8 WALKER DR.**
 City **WEST BOURNE** State **MA** ZIP **01581**

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5 Packaging * Desired value limit \$25K
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 No Signature Required
 Direct Signature
 Indirect Signature
 Does this shipment contain dangerous goods?
 No Yes
 Cargo Aircraft Only

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below. Obtain rec's Acct. No.
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ANALYTICAL REPORT

Lab Number:	L1634893
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	14-3136
Report Date:	11/04/16

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:11041616:42

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1634893-01	INFLUENT 102716	WATER	VA	10/27/16 18:00	10/28/16
L1634893-02	POST CLARIFIER 102716	WATER	VA	10/27/16 18:00	10/28/16
L1634893-03	EFFLUENT 102716	WATER	VA	10/27/16 18:00	10/28/16

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

A container for TSS was not received for the "POST CLARIFIER 102716" sample, but was listed on the chain of custody. This was verified by the client.

Chloride

The Effluent (L1634893-03) result is greater than the Influent (L1634893-01) result. The sample containers were verified as being labeled correctly by the laboratory.

Nitrogen, Ammonia

The WG947797-3 Laboratory Duplicate RPD (21%), performed on L1634893-03, is above the acceptance criteria; however, the sample and duplicate results are less than five times the reporting limit. Therefore, the RPD is valid.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Lura L Troy

Title: Technical Director/Representative

Date: 11/04/16

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634893-03
 Client ID: EFFLUENT 102716
 Sample Location: VA
 Matrix: Water
 Analytical Method: 1,8015C(M)
 Analytical Date: 11/03/16 02:42
 Analyst: DG

Date Collected: 10/27/16 18:00
 Date Received: 10/28/16
 Field Prep: Not Specified
 Extraction Method: EPA 3510C
 Extraction Date: 11/02/16 09:16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Petroleum Hydrocarbon Quantitation - Westborough Lab						
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TPH	72.9	J	ug/l	200	42.0	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	100		40-140

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634893-03
 Client ID: EFFLUENT 102716
 Sample Location: VA
 Matrix: Water
 Analytical Method: 1,8015C(M)
 Analytical Date: 11/03/16 03:03
 Analyst: JM

Date Collected: 10/27/16 18:00
 Date Received: 10/28/16
 Field Prep: Not Specified
 Extraction Method:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Gasoline Range Organics - Westborough Lab

Gasoline Range Organics	ND		ug/l	50	3.0	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	118		70-130
4-Bromofluorobenzene	108		70-130

Project Name: DOMINION CHESTERFIELD

Lab Number: L1634893

Project Number: 14-3136

Report Date: 11/04/16

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 1,8015C(M)
 Analytical Date: 11/03/16 00:33
 Analyst: DG

Extraction Method: EPA 3510C
 Extraction Date: 11/02/16 09:16

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 03 Batch: WG948282-1					
TPH	ND		ug/l	200	42.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	102		40-140

Project Name: DOMINION CHESTERFIELD

Lab Number: L1634893

Project Number: 14-3136

Report Date: 11/04/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
 Analytical Date: 11/03/16 00:21
 Analyst: JM

Parameter	Result	Qualifier	Units	RL	MDL
Gasoline Range Organics - Westborough Lab for sample(s): 03 Batch: WG948723-3					
Gasoline Range Organics	14	J	ug/l	50	3.0

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	119		70-130
4-Bromofluorobenzene	107		70-130

Serial_No:11041616:42

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 03 Batch: WG948282-2								
TPH	117		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	109				40-140



Serial_No:11041616:42

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab Associated sample(s): 03 Batch: WG948723-1 WG948723-2								
Gasoline Range Organics	103		106		80-120	3		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,1,1-Trifluorotoluene	119		122		70-130
4-Bromofluorobenzene	111		114		70-130



Serial_No:11041616:42

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Gasoline Range Organics - Westborough Lab Associated sample(s): 03 QC Batch ID: WG948723-5 QC Sample: L1634893-03 Client ID: EFFLUENT 102716												
Gasoline Range Organics	ND	400	420	106		-	-		80-120	-		20

<i>Surrogate</i>	<i>MS</i>		<i>MSD</i>		<i>Acceptance Criteria</i>
	<i>% Recovery</i>	<i>Qualifier</i>	<i>% Recovery</i>	<i>Qualifier</i>	
1,1,1-Trifluorotoluene	115				70-130
4-Bromofluorobenzene	110				70-130



Serial_No:11041616:42

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Gasoline Range Organics - Westborough Lab Associated sample(s): 03 QC Batch ID: WG948723-4 QC Sample: L1634893-03 Client ID: EFFLUENT 102716						
Gasoline Range Organics	ND	ND	ug/l	NC		20

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
1,1,1-Trifluorotoluene	118		119		70-130
4-Bromofluorobenzene	108		108		70-130



METALS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634893-01
 Client ID: INFLUENT 102716
 Sample Location: VA
 Matrix: Water

Date Collected: 10/27/16 18:00
 Date Received: 10/28/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0089		mg/l	0.0040	0.0004	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0770		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Cadmium, Total	0.0003	J	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Chromium, Total	0.0122		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Copper, Total	0.0068		mg/l	0.0010	0.0004	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Iron, Total	0.614		mg/l	0.050	0.009	1	11/03/16 05:45	11/03/16 11:12	EPA 3005A	19,200.7	JH
Lead, Total	0.0035		mg/l	0.0010	0.0003	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	11/02/16 12:01	11/03/16 19:23	EPA 245.1	3,245.1	EA
Nickel, Total	0.0131		mg/l	0.0020	0.0006	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Selenium, Total	0.0420		mg/l	0.0050	0.0017	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0003	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Thallium, Total	0.0008	J	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Zinc, Total	0.0167		mg/l	0.0100	0.0034	1	11/03/16 05:45	11/03/16 13:11	EPA 3005A	3,200.8	AM
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	0.0110		mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0677		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	0.0002	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0102		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0004	J	mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 16:41	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:28	EPA 245.1	3,245.1	EA
Nickel, Dissolved	0.0100		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Selenium, Dissolved	0.0391		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Thallium, Dissolved	0.0006	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0069	J	mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:31	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634893-02
 Client ID: POST CLARIFIER 102716
 Sample Location: VA
 Matrix: Water

Date Collected: 10/27/16 18:00
 Date Received: 10/28/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.0061		mg/l	0.0040	0.0004	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0045		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Cadmium, Total	0.0001	J	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Chromium, Total	0.0110		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Copper, Total	0.0023		mg/l	0.0010	0.0004	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Iron, Total	1.15		mg/l	0.050	0.009	1	11/03/16 05:45	11/03/16 11:16	EPA 3005A	19,200.7	JH
Lead, Total	ND		mg/l	0.0010	0.0003	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	11/02/16 12:01	11/03/16 19:32	EPA 245.1	3,245.1	EA
Nickel, Total	0.0097		mg/l	0.0020	0.0006	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Selenium, Total	0.0313		mg/l	0.0050	0.0017	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0003	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Thallium, Total	0.0005	J	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Zinc, Total	0.0053	J	mg/l	0.0100	0.0034	1	11/03/16 05:45	11/03/16 13:14	EPA 3005A	3,200.8	AM
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	0.0067		mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0003	J	mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	0.0002	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0106		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0018	J	mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 16:45	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:30	EPA 245.1	3,245.1	EA
Nickel, Dissolved	0.0104		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Selenium, Dissolved	0.0310		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Thallium, Dissolved	0.0004	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0054	J	mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:34	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634893-03
 Client ID: EFFLUENT 102716
 Sample Location: VA
 Matrix: Water

Date Collected: 10/27/16 18:00
 Date Received: 10/28/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.0040	0.0004	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0003	J	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Chromium, Total	0.0009	J	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Copper, Total	ND		mg/l	0.0010	0.0004	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Iron, Total	0.011	J	mg/l	0.050	0.009	1	11/03/16 05:45	11/03/16 11:20	EPA 3005A	19,200.7	JH
Lead, Total	ND		mg/l	0.0010	0.0003	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	0.00006	1	11/02/16 12:01	11/03/16 19:34	EPA 245.1	3,245.1	EA
Nickel, Total	0.0010	J	mg/l	0.0020	0.0006	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Selenium, Total	0.0125		mg/l	0.0050	0.0017	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0003	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Zinc, Total	0.0039	J	mg/l	0.0100	0.0034	1	11/03/16 05:45	11/03/16 13:17	EPA 3005A	3,200.8	AM
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	0.0007	J	mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0004	J	mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0011		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 16:36	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:36	EPA 245.1	3,245.1	EA
Nickel, Dissolved	0.0025		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Selenium, Dissolved	0.0088		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Thallium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0051	J	mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:48	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-03 Batch: WG947802-1										
Antimony, Dissolved	0.0016	J	mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Copper, Dissolved	0.00196	J	mg/l	0.00200	0.00038	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Thallium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-03 Batch: WG947804-1										
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-03 Batch: WG947965-1										
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:17	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG948346-1									
Mercury, Total	ND	mg/l	0.00020	0.00006	1	11/02/16 12:01	11/03/16 19:19	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG948609-1									
Antimony, Total	ND	mg/l	0.0040	0.0004	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Arsenic, Total	ND	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Cadmium, Total	ND	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Chromium, Total	ND	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Copper, Total	ND	mg/l	0.0010	0.0004	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Lead, Total	ND	mg/l	0.0010	0.0003	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Nickel, Total	ND	mg/l	0.0020	0.0006	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Selenium, Total	ND	mg/l	0.0050	0.0017	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Silver, Total	ND	mg/l	0.0004	0.0003	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Thallium, Total	ND	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Zinc, Total	ND	mg/l	0.0100	0.0034	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG948610-1									
Iron, Total	ND	mg/l	0.050	0.009	1	11/03/16 05:45	11/03/16 10:07	19,200.7	JH

Prep Information

Digestion Method: EPA 3005A



Serial_No:11041616:42

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG947802-2								
Antimony, Dissolved	91		-		85-115	-		
Arsenic, Dissolved	102		-		85-115	-		
Cadmium, Dissolved	99		-		85-115	-		
Chromium, Dissolved	95		-		85-115	-		
Copper, Dissolved	97		-		85-115	-		
Lead, Dissolved	110		-		85-115	-		
Nickel, Dissolved	96		-		85-115	-		
Selenium, Dissolved	94		-		85-115	-		
Silver, Dissolved	96		-		85-115	-		
Thallium, Dissolved	102		-		85-115	-		
Zinc, Dissolved	95		-		85-115	-		
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG947804-2								
Iron, Dissolved	88		-		85-115	-		
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG947965-2								
Mercury, Dissolved	95		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG948346-2								
Mercury, Total	94		-		85-115	-		



Serial_No:11041616:42

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG948609-2					
Antimony, Total	89	-	85-115	-	
Arsenic, Total	110	-	85-115	-	
Cadmium, Total	102	-	85-115	-	
Chromium, Total	98	-	85-115	-	
Copper, Total	97	-	85-115	-	
Lead, Total	107	-	85-115	-	
Nickel, Total	104	-	85-115	-	
Selenium, Total	114	-	85-115	-	
Silver, Total	107	-	85-115	-	
Thallium, Total	104	-	85-115	-	
Zinc, Total	101	-	85-115	-	
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG948610-2					
Iron, Total	86	-	85-115	-	



Serial_No:11041616:42

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG947802-3 QC Sample: L1634447-01 Client ID: MS Sample												
Antimony, Dissolved	0.0135	0.5	0.6406	125	-	-	-	-	70-130	-	-	20
Arsenic, Dissolved	0.0631	0.12	0.1867	103	-	-	-	-	70-130	-	-	20
Cadmium, Dissolved	0.0003J	0.051	0.0481	94	-	-	-	-	70-130	-	-	20
Chromium, Dissolved	0.0035	0.2	0.1932	95	-	-	-	-	70-130	-	-	20
Copper, Dissolved	0.0008J	0.25	0.2423	97	-	-	-	-	70-130	-	-	20
Lead, Dissolved	ND	0.51	0.5173	101	-	-	-	-	70-130	-	-	20
Nickel, Dissolved	0.0106	0.5	0.4671	91	-	-	-	-	70-130	-	-	20
Selenium, Dissolved	0.0358	0.12	0.1614	105	-	-	-	-	70-130	-	-	20
Silver, Dissolved	ND	0.05	0.0454	91	-	-	-	-	70-130	-	-	20
Thallium, Dissolved	0.0007J	0.12	0.1137	95	-	-	-	-	70-130	-	-	20
Zinc, Dissolved	0.0359	0.5	0.4961	92	-	-	-	-	70-130	-	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG947804-3 QC Sample: L1634447-01 Client ID: MS Sample												
Iron, Dissolved	0.02J	1	0.94	94	-	-	-	-	75-125	-	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG947965-3 QC Sample: L1634662-01 Client ID: MS Sample												
Mercury, Dissolved	ND	0.005	0.00426	85	-	-	-	-	75-125	-	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG948346-3 QC Sample: L1634893-01 Client ID: INFLUENT 102716												
Mercury, Total	ND	0.005	0.00460	92	-	-	-	-	70-130	-	-	20



Serial_No:11041616:42

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG948609-3 QC Sample: L1634923-01 Client ID: MS Sample									
Antimony, Total	ND	0.5	0.5595	112	-	-	70-130	-	20
Arsenic, Total	0.0003J	0.12	0.1310	109	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.0636	125	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2185	109	-	-	70-130	-	20
Copper, Total	0.0153	0.25	0.2694	102	-	-	70-130	-	20
Lead, Total	0.0004J	0.51	0.5575	109	-	-	70-130	-	20
Nickel, Total	ND	0.5	0.5566	111	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1326	110	-	-	70-130	-	20
Silver, Total	ND	0.05	0.0562	112	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1274	106	-	-	70-130	-	20
Zinc, Total	ND	0.5	0.5333	107	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG948610-3 QC Sample: L1634923-01 Client ID: MS Sample									
Iron, Total	0.112	1	1.02	91	-	-	75-125	-	20



Serial_No:11041616:42

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG947802-4 QC Sample: L1634447-01 Client ID: DUP Sample						
Antimony, Dissolved	0.0135	0.0126	mg/l	7		20
Arsenic, Dissolved	0.0631	0.0626	mg/l	1		20
Cadmium, Dissolved	0.0003J	0.0003J	mg/l	NC		20
Chromium, Dissolved	0.0035	0.0035	mg/l	0		20
Copper, Dissolved	0.0008J	0.0009J	mg/l	NC		20
Lead, Dissolved	ND	ND	mg/l	NC		20
Nickel, Dissolved	0.0106	0.0110	mg/l	4		20
Selenium, Dissolved	0.0358	0.0384	mg/l	7		20
Silver, Dissolved	ND	ND	mg/l	NC		20
Thallium, Dissolved	0.0007J	0.0007J	mg/l	NC		20
Zinc, Dissolved	0.0359	0.0368	mg/l	2		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG947804-4 QC Sample: L1634447-01 Client ID: DUP Sample						
Iron, Dissolved	0.02J	0.02J	mg/l	NC		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG947965-4 QC Sample: L1634662-01 Client ID: DUP Sample						
Mercury, Dissolved	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG948346-4 QC Sample: L1634893-01 Client ID: INFLUENT 102716						
Mercury, Total	ND	ND	mg/l	NC		20



Serial_No:11041616:42

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG948609-4 QC Sample: L1634923-01 Client ID: DUP Sample					
Arsenic, Total	0.0003J	0.0004J	mg/l	NC	20
Copper, Total	0.0153	0.0123	mg/l	22 Q	20
Lead, Total	0.0004J	0.0004J	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG948610-4 QC Sample: L1634923-01 Client ID: DUP Sample					
Iron, Total	0.112	0.113	mg/l	1	20



INORGANICS & MISCELLANEOUS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634893-01
Client ID: INFLUENT 102716
Sample Location: VA
Matrix: Water

Date Collected: 10/27/16 18:00
Date Received: 10/28/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	48.		mg/l	1.0	NA	1	-	11/02/16 01:17	121,2540D	MC
Chloride	150		mg/l	10	2.0	10	-	10/28/16 20:56	121,4500CL-E	ML
Nitrogen, Ammonia	0.826		mg/l	0.375	0.142	5	11/01/16 12:04	11/01/16 23:50	121,4500NH3-BH	AT
Total Organic Carbon	1.89		mg/l	1.00	0.228	2	-	11/01/16 07:07	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/29/16 11:40	10/29/16 12:40	74,1664A	KZ
Chromium, Hexavalent	0.010		mg/l	0.010	0.003	1	10/28/16 15:50	10/28/16 16:07	1,7196A	LH



Project Name: DOMINION CHESTERFIELD

Lab Number: L1634893

Project Number: 14-3136

Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634893-02
 Client ID: POST CLARIFIER 102716
 Sample Location: VA
 Matrix: Water

Date Collected: 10/27/16 18:00
 Date Received: 10/28/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chloride	170		mg/l	10	2.0	10	-	10/28/16 20:58	121,4500CL-E	ML
Chromium, Hexavalent	0.013		mg/l	0.010	0.003	1	10/28/16 15:50	10/28/16 16:07	1,7196A	LH



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1634893-03
Client ID: EFFLUENT 102716
Sample Location: VA
Matrix: Water

Date Collected: 10/27/16 18:00
Date Received: 10/28/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	ND		mg/l	1.0	NA	1	-	11/02/16 01:17	121,2540D	MC
Chloride	190		mg/l	10	2.0	10	-	10/28/16 21:00	121,4500CL-E	ML
Nitrogen, Ammonia	0.149		mg/l	0.075	0.028	1	11/01/16 12:04	11/01/16 23:51	121,4500NH3-BH	AT
Total Organic Carbon	0.560		mg/l	0.500	0.114	1	-	11/01/16 07:07	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/29/16 11:40	10/29/16 12:40	74,1664A	KZ
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/28/16 15:50	10/28/16 16:08	1,7196A	LH



Project Name: DOMINION CHESTERFIELD

Lab Number: L1634893

Project Number: 14-3136

Report Date: 11/04/16

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG946937-1										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/28/16 15:50	10/28/16 16:06	1,7196A	LH
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG946958-1										
Chloride	0.22	J	mg/l	1.0	0.20	1	-	10/28/16 18:36	121,4500CL-E	ML
General Chemistry - Westborough Lab for sample(s): 01,03 Batch: WG947192-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/29/16 11:40	10/29/16 12:40	74,1664A	KZ
General Chemistry - Westborough Lab for sample(s): 01,03 Batch: WG947772-1										
Total Organic Carbon	ND		mg/l	0.500	0.114	1	-	11/01/16 07:07	121,5310C	DW
General Chemistry - Westborough Lab for sample(s): 01,03 Batch: WG947797-1										
Nitrogen, Ammonia	ND		mg/l	0.075	0.028	1	11/01/16 12:04	11/01/16 23:39	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01,03 Batch: WG948132-1										
Solids, Total Suspended	ND		mg/l	1.0	NA	1	-	11/02/16 01:17	121,2540D	MC



Serial_No:11041616:42

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG946937-2								
Chromium, Hexavalent	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG946958-2								
Chloride	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01,03 Batch: WG947192-2								
Oil & Grease, Hem-Grav	98		-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01,03 Batch: WG947772-2								
Total Organic Carbon	91		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01,03 Batch: WG947797-2								
Nitrogen, Ammonia	92		-		80-120	-		20



Serial_No:11041616:42

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG946937-4 QC Sample: L1634893-02 Client ID: POST CLARIFIER 102716												
Chromium, Hexavalent	0.013	0.1	0.119	106	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG946958-4 QC Sample: L1634804-02 Client ID: MS Sample												
Chloride	61.	20	77	80	-	-	-	-	58-140	-	-	7
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG947192-4 QC Sample: L1634864-02 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	42.1	34	82	-	-	-	-	78-114	-	-	18
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG947772-4 QC Sample: L1635173-01 Client ID: MS Sample												
Total Organic Carbon	14.2	40	50.9	92	-	-	-	-	80-120	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG947797-4 QC Sample: L1634893-03 Client ID: EFFLUENT 102716												
Nitrogen, Ammonia	0.149	4	4.10	99	-	-	-	-	80-120	-	-	20



Serial_No:11041616:42

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1634893
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG946937-3 QC Sample: L1634893-01 Client ID: INFLUENT 102716						
Chromium, Hexavalent	0.010	0.011	mg/l	10		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG946958-3 QC Sample: L1634804-02 Client ID: DUP Sample						
Chloride	61.	58	mg/l	5		7
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG947192-3 QC Sample: L1634862-02 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG947772-3 QC Sample: L1635173-01 Client ID: DUP Sample						
Total Organic Carbon	14.2	14.8	mg/l	4		20
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG947797-3 QC Sample: L1634893-03 Client ID: EFFLUENT 102716						
Nitrogen, Ammonia	0.149	0.184	mg/l	21	Q	20
General Chemistry - Westborough Lab Associated sample(s): 01,03 QC Batch ID: WG948132-2 QC Sample: L1634666-03 Client ID: DUP Sample						
Solids, Total Suspended	88.	100	mg/l	13		29



Project Name: DOMINION CHESTERFIELD

Lab Number: L1634893

Project Number: 14-3136

Report Date: 11/04/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1634893-01A	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1634893-01B	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1634893-01B1	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1634893-01C	Plastic 500ml H2SO4 preserved	A	<2	4.4	Y	Absent	NH3-4500(28)
L1634893-01D	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	HEXCR-7196(1),CL-4500(28)
L1634893-01D1	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	CL-4500(28)
L1634893-01E	Plastic 950ml unpreserved	A	7	4.4	Y	Absent	TSS-2540-LOW(7)
L1634893-01F	Amber 1000ml HCl preserved	A	N/A	4.4	Y	Absent	OG-1664(28)
L1634893-01G	Amber 1000ml HCl preserved	A	N/A	4.4	Y	Absent	OG-1664(28)
L1634893-01H	Plastic 250ml HNO3 preserved	A	<2	4.4	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1634893-01I	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	-
L1634893-01X	Plastic 120ml HNO3 preserved Fil	A	<2	4.4	Y	Absent	AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1634893-02A	Plastic 250ml HNO3 preserved	A	<2	4.4	Y	Absent	CD-2008T(180),FE-RI(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1634893-02B	Plastic 250ml unpreserved	A	<2	4.4	Y	Absent	-
L1634893-02C	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	HEXCR-7196(1),CL-4500(28)
L1634893-02X	Plastic 120ml HNO3 preserved Fil	A	<2	4.4	Y	Absent	AG-2008S(180),CR-2008S(180),AS-2008S(180),FE-UI(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)

*Values in parentheses indicate holding time in days

Project Name: DOMINION CHESTERFIELD

Project Number: 14-3136

Lab Number: L1634893

Report Date: 11/04/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1634893-03A	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1634893-03B	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1634893-03B1	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1634893-03C	Plastic 500ml H2SO4 preserved	A	<2	4.4	Y	Absent	NH3-4500(28)
L1634893-03D	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	HEXCR-7196(1),CL-4500(28)
L1634893-03D1	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	CL-4500(28)
L1634893-03E	Plastic 950ml unpreserved	A	7	4.4	Y	Absent	TSS-2540-LOW(7)
L1634893-03F	Amber 1000ml HCl preserved	A	N/A	4.4	Y	Absent	OG-1664(28)
L1634893-03G	Amber 1000ml HCl preserved	A	N/A	4.4	Y	Absent	OG-1664(28)
L1634893-03H	Plastic 250ml HNO3 preserved	A	<2	4.4	Y	Absent	CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1634893-03I	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	-
L1634893-03J	Amber 1000ml unpreserved	A	7	4.4	Y	Absent	TPH-DRO-D(7)
L1634893-03K	Amber 1000ml unpreserved	A	7	4.4	Y	Absent	TPH-DRO-D(7)
L1634893-03X	Plastic 120ml HNO3 preserved Fil	A	<2	4.4	Y	Absent	AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1634893-03Y	Vial HCl preserved	A	N/A	4.4	Y	Absent	TPH-GRO(14)
L1634893-03Z	Vial HCl preserved	A	N/A	4.4	Y	Absent	TPH-GRO(14)
L1634893-03Z1	Vial HCl preserved	A	N/A	4.4	Y	Absent	TPH-GRO(14)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1634893
Report Date: 11/04/16

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 <p>NEW JERSEY CHAIN OF CUSTODY</p> <p>Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193</p> <p>Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288</p>	<p>Service Centers</p> <p>Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105</p>	<p>Page 1 of 1</p>	<p>Date Rec'd in Lab 10/27/16</p>	<p>ALPHA Job # L1634893</p>																
	<p>Project Information</p> <p>Project Name: DOMINION CHESTER FIELD</p> <p>Project Location: VA</p> <p>Project # 14-3136</p> <p>(Use Project name as Project #) <input type="checkbox"/></p>	<p>Deliverables</p> <p><input type="checkbox"/> NJ Full / Reduced</p> <p><input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> EQUIS (4 File)</p> <p><input type="checkbox"/> Other</p>	<p>Billing Information</p> <p><input checked="" type="checkbox"/> Same as Client Info</p> <p>PO #</p>																	
<p>Client Information</p> <p>Client: GLTT</p> <p>Address: 627 Mt. Hope Rd. Whitton, VA 07885</p> <p>Phone: 973-983-0901</p> <p>Fax: -0703</p> <p>Email: corla_lo@gltt.com</p>	<p>Project Manager: JIM CARLSON</p> <p>ALPHAQuote #:</p> <p>Turn-Around Time</p> <p>Standard <input type="checkbox"/> Due Date:</p> <p>Rush (only if pre approved) <input type="checkbox"/> # of Days:</p>	<p>Regulatory Requirement</p> <p><input type="checkbox"/> SRS Residential/Non Residential</p> <p><input type="checkbox"/> SRS Impact to Groundwater</p> <p><input type="checkbox"/> NJ Ground Water Quality Standards</p> <p><input type="checkbox"/> NJ IGW SPLP Leachate Criteria</p> <p><input checked="" type="checkbox"/> Other VADEQ</p>	<p>Site Information</p> <p>Is this site impacted by Petroleum? Yes <input type="checkbox"/></p> <p>Petroleum Product:</p>																	
<p>These samples have been previously analyzed by Alpha <input type="checkbox"/></p> <p>For EPH, selection is REQUIRED:</p> <p><input type="checkbox"/> Category 1</p> <p><input type="checkbox"/> Category 2</p>	<p>For VOC, selection is REQUIRED:</p> <p><input type="checkbox"/> 1,4-Dioxane 8011</p>	<p>Other project specific requirements/comments:</p> <p>METALS by 200.8</p> <p>Please specify Metals or TAL.</p> <p>So, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Zn</p>	<p>ANALYSIS</p> <table border="1"> <tr> <th>TOC</th> <th>AMMONIA</th> <th>TSS/CHLORIDE</th> <th>DTG/ICGA</th> <th>TOTAL METALS</th> <th>Hex Cr / DISCUSSED METALS</th> <th>TPH-DRO</th> <th>TPH-GRO</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	TOC	AMMONIA	TSS/CHLORIDE	DTG/ICGA	TOTAL METALS	Hex Cr / DISCUSSED METALS	TPH-DRO	TPH-GRO									<p>Sample Filtration</p> <p><input type="checkbox"/> Done</p> <p><input checked="" type="checkbox"/> Lab to do Preservation</p> <p><input type="checkbox"/> Lab to do</p> <p>(Please Specify below)</p>
TOC	AMMONIA	TSS/CHLORIDE	DTG/ICGA	TOTAL METALS	Hex Cr / DISCUSSED METALS	TPH-DRO	TPH-GRO													
<p>ALPHA Lab ID (Lab Use Only)</p>	<p>Sample ID</p>	<p>Collection Date Time</p>	<p>Sample Matrix</p>	<p>Sampler's Initials</p>	<p>TOC</p>	<p>AMMONIA</p>	<p>TSS/CHLORIDE</p>	<p>DTG/ICGA</p>	<p>TOTAL METALS</p>	<p>Hex Cr / DISCUSSED METALS</p>	<p>TPH-DRO</p>	<p>TPH-GRO</p>	<p>Sample Specific Comments</p>	<p>Total Bottles</p>						
34893	D1 INFLUENT 102716	10/27/16 1800	WW	RMD	X	X	X	X	X	X				11						
	D2 POSIT CLARIFIER 102716	10/27/16 1800	WW	RMD			X		X	X				3						
	D3 EFFLUENT 102716	10/27/16 1800	WW	RMD	X	X	X	X	X	X	X	X		16						
<p>Preservative Code:</p> <p>A = None B = HCl C = HNO₃ D = H₂SO₄ E = NaOH F = MeOH G = NaHSO₄ H = Na₂S₂O₃ K/E = Zn Ac/NaOH O = Other</p>		<p>Container Code</p> <p>P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle</p>		<p>Westboro: Certification No: MA935</p> <p>Mansfield: Certification No: MA015</p>		<p>Container Type</p>	<p>V P P A P P A V</p>						<p>Preservative</p>		<p>D D A B C A A B</p>		<p>Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)</p>			
<p>Relinquished By: GLTT</p>		<p>Date/Time: 10/27/16 1800</p>		<p>Received By: [Signature]</p>		<p>Date/Time: 10/27/16 0930</p>														



ANALYTICAL REPORT

Lab Number:	L1635088
Client:	Groundwater Treatment & Technology 627 Mount Hope Road Wharton, NJ 07885
ATTN:	Rob Orlando
Phone:	(973) 983-0901
Project Name:	DOMINION CHESTERFIELD
Project Number:	14-3136
Report Date:	11/04/16

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Serial_No:11041615:30

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1635088-01	INFLUENT	WATER	VA	10/28/16 18:00	10/29/16
L1635088-02	EFFLUENT	WATER	VA	10/28/16 18:00	10/29/16

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Chloride

The Effluent (L1635088-02) result is greater than the Influent (L1635088-01) result. The sample containers were verified as being labeled correctly by the laboratory.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 11/04/16

METALS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1635088-01
 Client ID: INFLUENT
 Sample Location: VA
 Matrix: Water

Date Collected: 10/28/16 18:00
 Date Received: 10/29/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	1.515		mg/l	0.0100	0.0033	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Antimony, Total	0.0052		mg/l	0.0040	0.0004	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0508		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Barium, Total	0.2281		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Beryllium, Total	0.0006	J	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Boron, Total	1.19		mg/l	0.030	0.002	1	11/03/16 05:45	11/03/16 14:39	EPA 3005A	19,200.7	JH
Cadmium, Total	0.0002	J	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Calcium, Total	84.8		mg/l	0.100	0.035	1	11/03/16 05:45	11/03/16 14:39	EPA 3005A	19,200.7	JH
Chromium, Total	0.0054		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Cobalt, Total	0.0041		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Copper, Total	0.0053		mg/l	0.0010	0.0004	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Iron, Total	0.532		mg/l	0.050	0.009	1	11/03/16 05:45	11/03/16 14:39	EPA 3005A	19,200.7	JH
Lead, Total	0.0029		mg/l	0.0010	0.0003	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Magnesium, Total	9.42		mg/l	0.100	0.015	1	11/03/16 05:45	11/03/16 14:39	EPA 3005A	19,200.7	JH
Mercury, Total	ND		mg/l	0.00020	0.00006	1	11/02/16 12:01	11/03/16 19:41	EPA 245.1	3,245.1	EA
Molybdenum, Total	0.0592		mg/l	0.0020	0.0007	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Nickel, Total	0.0116		mg/l	0.0020	0.0006	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Potassium, Total	7.49		mg/l	2.50	0.237	1	11/03/16 05:45	11/03/16 14:39	EPA 3005A	19,200.7	JH
Selenium, Total	0.0229		mg/l	0.0050	0.0017	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0003	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Sodium, Total	77.4		mg/l	2.00	0.120	1	11/03/16 05:45	11/03/16 14:39	EPA 3005A	19,200.7	JH
Thallium, Total	0.0008	J	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Vanadium, Total	0.0399		mg/l	0.0050	0.0016	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Zinc, Total	0.0139		mg/l	0.0100	0.0034	1	11/03/16 05:45	11/03/16 13:20	EPA 3005A	3,200.8	AM
Dissolved Metals - Mansfield Lab											
Aluminum, Dissolved	0.1375		mg/l	0.0100	0.0033	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Antimony, Dissolved	0.0074		mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0430		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Barium, Dissolved	0.193		mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Beryllium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1635088-01
Client ID: INFLUENT
Sample Location: VA
Matrix: Water

Date Collected: 10/28/16 18:00
Date Received: 10/29/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Boron, Dissolved	1.45		mg/l	0.030	0.002	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Cadmium, Dissolved	0.0003	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Calcium, Dissolved	91		mg/l	0.10	0.04	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Chromium, Dissolved	0.0043		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Cobalt, Dissolved	0.003	J	mg/l	0.020	0.002	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Copper, Dissolved	0.0009	J	mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Magnesium, Dissolved	9.6		mg/l	0.10	0.02	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:38	EPA 245.1	3,245.1	EA
Molybdenum, Dissolved	0.07		mg/l	0.05	0.004	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Nickel, Dissolved	0.0102		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Potassium, Dissolved	7.4		mg/l	2.5	0.24	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Selenium, Dissolved	0.0210		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Sodium, Dissolved	80		mg/l	2.0	0.12	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Thallium, Dissolved	0.0007	J	mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM
Vanadium, Dissolved	0.036		mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 16:54	EPA 3005A	19,200.7	JH
Zinc, Dissolved	0.0096	J	mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:51	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1635088-02
 Client ID: EFFLUENT
 Sample Location: VA
 Matrix: Water

Date Collected: 10/28/16 18:00
 Date Received: 10/29/16
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.2748		mg/l	0.0100	0.0033	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.0040	0.0004	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0003	J	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Barium, Total	0.0014		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Boron, Total	1.61		mg/l	0.030	0.002	1	11/03/16 05:45	11/03/16 15:44	EPA 3005A	19,200.7	JH
Cadmium, Total	ND		mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Calcium, Total	80.1		mg/l	0.100	0.035	1	11/03/16 05:45	11/03/16 15:44	EPA 3005A	19,200.7	JH
Chromium, Total	0.0020		mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Cobalt, Total	0.0002	J	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Copper, Total	ND		mg/l	0.0010	0.0004	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Iron, Total	0.019	J	mg/l	0.050	0.009	1	11/03/16 05:45	11/03/16 15:44	EPA 3005A	19,200.7	JH
Lead, Total	ND		mg/l	0.0010	0.0003	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Magnesium, Total	8.29		mg/l	0.100	0.015	1	11/03/16 05:45	11/03/16 15:44	EPA 3005A	19,200.7	JH
Mercury, Total	ND		mg/l	0.00020	0.00006	1	11/02/16 12:01	11/03/16 19:43	EPA 245.1	3,245.1	EA
Molybdenum, Total	0.0008	J	mg/l	0.0020	0.0007	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Nickel, Total	0.0011	J	mg/l	0.0020	0.0006	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Potassium, Total	7.20		mg/l	2.50	0.237	1	11/03/16 05:45	11/03/16 15:44	EPA 3005A	19,200.7	JH
Selenium, Total	0.0208		mg/l	0.0050	0.0017	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.0004	0.0003	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Sodium, Total	89.4		mg/l	2.00	0.120	1	11/03/16 05:45	11/03/16 15:44	EPA 3005A	19,200.7	JH
Thallium, Total	ND		mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Vanadium, Total	ND		mg/l	0.0050	0.0016	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.0100	0.0034	1	11/03/16 05:45	11/03/16 13:55	EPA 3005A	3,200.8	AM
Dissolved Metals - Mansfield Lab											
Aluminum, Dissolved	0.2708		mg/l	0.0100	0.0033	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Antimony, Dissolved	0.0005	J	mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0003	J	mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Barium, Dissolved	ND		mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Beryllium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1635088-02
Client ID: EFFLUENT
Sample Location: VA
Matrix: Water

Date Collected: 10/28/16 18:00
Date Received: 10/29/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Boron, Dissolved	1.62		mg/l	0.030	0.002	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Cadmium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Calcium, Dissolved	87		mg/l	0.10	0.04	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Chromium, Dissolved	0.0022		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Cobalt, Dissolved	ND		mg/l	0.020	0.002	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Copper, Dissolved	ND		mg/l	0.0020	0.0004	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Magnesium, Dissolved	8.6		mg/l	0.10	0.02	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Mercury, Dissolved	ND		mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:40	EPA 245.1	3,245.1	EA
Molybdenum, Dissolved	ND		mg/l	0.05	0.004	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Nickel, Dissolved	ND		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Potassium, Dissolved	7.5		mg/l	2.5	0.24	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Selenium, Dissolved	0.0203		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Sodium, Dissolved	96		mg/l	2.0	0.12	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Thallium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM
Vanadium, Dissolved	ND		mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 16:49	EPA 3005A	19,200.7	JH
Zinc, Dissolved	ND		mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:54	EPA 3005A	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947802-1										
Aluminum, Dissolved	0.0046	J	mg/l	0.0100	0.0033	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Antimony, Dissolved	0.0016	J	mg/l	0.0040	0.0004	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Beryllium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	0.0002	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Copper, Dissolved	0.00196	J	mg/l	0.00200	0.00038	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Lead, Dissolved	ND		mg/l	0.0010	0.0003	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	0.0006	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	0.0017	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	0.0003	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Thallium, Dissolved	ND		mg/l	0.0010	0.0001	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	0.0034	1	11/01/16 08:30	11/02/16 10:06	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947804-1										
Barium, Dissolved	ND		mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Calcium, Dissolved	ND		mg/l	0.10	0.04	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Cobalt, Dissolved	ND		mg/l	0.020	0.002	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Iron, Dissolved	ND		mg/l	0.05	0.01	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Magnesium, Dissolved	ND		mg/l	0.10	0.02	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Molybdenum, Dissolved	ND		mg/l	0.05	0.004	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Potassium, Dissolved	ND		mg/l	2.5	0.24	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Sodium, Dissolved	ND		mg/l	2.0	0.12	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH
Vanadium, Dissolved	ND		mg/l	0.010	0.002	1	11/01/16 08:30	11/01/16 15:37	19,200.7	JH



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Method Blank Analysis Batch Quality Control

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-02 Batch: WG947965-1									
Mercury, Dissolved	ND	mg/l	0.00020	0.00006	1	11/01/16 13:56	11/01/16 22:17	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG948346-1									
Mercury, Total	ND	mg/l	0.00020	0.00006	1	11/02/16 12:01	11/03/16 19:19	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG948609-1									
Aluminum, Total	ND	mg/l	0.0100	0.0033	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Antimony, Total	ND	mg/l	0.0040	0.0004	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Arsenic, Total	ND	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Barium, Total	ND	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Beryllium, Total	ND	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Cadmium, Total	ND	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Chromium, Total	ND	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Cobalt, Total	ND	mg/l	0.0010	0.0002	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Copper, Total	ND	mg/l	0.0010	0.0004	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Lead, Total	ND	mg/l	0.0010	0.0003	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Molybdenum, Total	ND	mg/l	0.0020	0.0007	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Nickel, Total	ND	mg/l	0.0020	0.0006	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Method Blank Analysis Batch Quality Control

Selenium, Total	ND	mg/l	0.0050	0.0017	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Silver, Total	ND	mg/l	0.0004	0.0003	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Thallium, Total	ND	mg/l	0.0010	0.0001	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Vanadium, Total	ND	mg/l	0.0050	0.0016	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM
Zinc, Total	ND	mg/l	0.0100	0.0034	1	11/03/16 05:45	11/03/16 11:58	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG948610-1									
Boron, Total	ND	mg/l	0.030	0.002	1	11/03/16 05:45	11/03/16 10:07	19,200.7	JH
Calcium, Total	ND	mg/l	0.100	0.035	1	11/03/16 05:45	11/03/16 10:07	19,200.7	JH
Iron, Total	ND	mg/l	0.050	0.009	1	11/03/16 05:45	11/03/16 10:07	19,200.7	JH
Magnesium, Total	ND	mg/l	0.100	0.015	1	11/03/16 05:45	11/03/16 10:07	19,200.7	JH
Potassium, Total	ND	mg/l	2.50	0.237	1	11/03/16 05:45	11/03/16 10:07	19,200.7	JH
Sodium, Total	ND	mg/l	2.00	0.120	1	11/03/16 05:45	11/03/16 10:07	19,200.7	JH

Prep Information

Digestion Method: EPA 3005A



Serial_No:11041615:30

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947802-2								
Aluminum, Dissolved	100		-		85-115	-		
Antimony, Dissolved	91		-		85-115	-		
Arsenic, Dissolved	102		-		85-115	-		
Beryllium, Dissolved	96		-		85-115	-		
Cadmium, Dissolved	99		-		85-115	-		
Chromium, Dissolved	95		-		85-115	-		
Copper, Dissolved	97		-		85-115	-		
Lead, Dissolved	110		-		85-115	-		
Nickel, Dissolved	96		-		85-115	-		
Selenium, Dissolved	94		-		85-115	-		
Silver, Dissolved	96		-		85-115	-		
Thallium, Dissolved	102		-		85-115	-		
Zinc, Dissolved	95		-		85-115	-		



Serial_No:11041615:30

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947804-2					
Barium, Dissolved	96	-	85-115	-	
Calcium, Dissolved	99	-	85-115	-	
Cobalt, Dissolved	96	-	85-115	-	
Iron, Dissolved	88	-	85-115	-	
Magnesium, Dissolved	100	-	85-115	-	
Molybdenum, Dissolved	91	-	85-115	-	
Potassium, Dissolved	98	-	85-115	-	
Sodium, Dissolved	100	-	85-115	-	
Vanadium, Dissolved	98	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG947965-2					
Mercury, Dissolved	95	-	85-115	-	
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG948346-2					
Mercury, Total	94	-	85-115	-	



Serial_No:11041615:30

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG948609-2					
Aluminum, Total	102	-	85-115	-	
Antimony, Total	89	-	85-115	-	
Arsenic, Total	110	-	85-115	-	
Barium, Total	99	-	85-115	-	
Beryllium, Total	97	-	85-115	-	
Cadmium, Total	102	-	85-115	-	
Chromium, Total	98	-	85-115	-	
Cobalt, Total	98	-	85-115	-	
Copper, Total	97	-	85-115	-	
Lead, Total	107	-	85-115	-	
Molybdenum, Total	86	-	85-115	-	
Nickel, Total	104	-	85-115	-	
Selenium, Total	114	-	85-115	-	
Silver, Total	107	-	85-115	-	
Thallium, Total	104	-	85-115	-	
Vanadium, Total	100	-	85-115	-	
Zinc, Total	101	-	85-115	-	



Serial_No:11041615:30

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG948610-2					
Boron, Total	112	-	85-115	-	
Calcium, Total	90	-	85-115	-	
Iron, Total	86	-	85-115	-	
Magnesium, Total	102	-	85-115	-	
Potassium, Total	96	-	85-115	-	
Sodium, Total	97	-	85-115	-	



Serial_No:11041615:30

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947802-3 QC Sample: L1634447-01 Client ID: MS Sample												
Aluminum, Dissolved	0.1624	2	2.073	96		-	-		70-130	-		20
Antimony, Dissolved	0.0135	0.5	0.6406	125		-	-		70-130	-		20
Arsenic, Dissolved	0.0631	0.12	0.1867	103		-	-		70-130	-		20
Beryllium, Dissolved	ND	0.05	0.0494	99		-	-		70-130	-		20
Cadmium, Dissolved	0.0003J	0.051	0.0481	94		-	-		70-130	-		20
Chromium, Dissolved	0.0035	0.2	0.1932	95		-	-		70-130	-		20
Copper, Dissolved	0.0008J	0.25	0.2423	97		-	-		70-130	-		20
Lead, Dissolved	ND	0.51	0.5173	101		-	-		70-130	-		20
Nickel, Dissolved	0.0106	0.5	0.4671	91		-	-		70-130	-		20
Selenium, Dissolved	0.0358	0.12	0.1614	105		-	-		70-130	-		20
Silver, Dissolved	ND	0.05	0.0454	91		-	-		70-130	-		20
Thallium, Dissolved	0.0007J	0.12	0.1137	95		-	-		70-130	-		20
Zinc, Dissolved	0.0359	0.5	0.4961	92		-	-		70-130	-		20



Serial_No:11041615:30

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947804-3 QC Sample: L1634447-01 Client ID: MS Sample									
Barium, Dissolved	0.287	2	2.22	97	-	-	75-125	-	20
Calcium, Dissolved	90.	10	100	100	-	-	75-125	-	20
Cobalt, Dissolved	0.003J	0.5	0.482	96	-	-	75-125	-	20
Iron, Dissolved	0.02J	1	0.94	94	-	-	75-125	-	20
Magnesium, Dissolved	9.1	10	19	99	-	-	75-125	-	20
Molybdenum, Dissolved	0.12	1	1.1	98	-	-	75-125	-	20
Potassium, Dissolved	7.1	10	16	89	-	-	75-125	-	20
Sodium, Dissolved	50.	10	60	100	-	-	75-125	-	20
Vanadium, Dissolved	0.052	0.5	0.551	100	-	-	75-125	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947965-3 QC Sample: L1634662-01 Client ID: MS Sample									
Mercury, Dissolved	ND	0.005	0.00426	85	-	-	75-125	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG948346-3 QC Sample: L1634893-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.00460	92	-	-	70-130	-	20



Serial_No:11041615:30

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG948609-3 QC Sample: L1634923-01 Client ID: MS Sample									
Aluminum, Total	0.0360	2	2.121	104	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.5595	112	-	-	70-130	-	20
Arsenic, Total	0.0003J	0.12	0.1310	109	-	-	70-130	-	20
Barium, Total	0.0017	2	2.043	102	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.0490	98	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.0636	125	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2185	109	-	-	70-130	-	20
Cobalt, Total	ND	0.5	0.5209	104	-	-	70-130	-	20
Copper, Total	0.0153	0.25	0.2694	102	-	-	70-130	-	20
Lead, Total	0.0004J	0.51	0.5575	109	-	-	70-130	-	20
Molybdenum, Total	ND	1	1.016	102	-	-	70-130	-	20
Nickel, Total	ND	0.5	0.5566	111	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1326	110	-	-	70-130	-	20
Silver, Total	ND	0.05	0.0562	112	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1274	106	-	-	70-130	-	20
Vanadium, Total	ND	0.5	0.5493	110	-	-	70-130	-	20
Zinc, Total	ND	0.5	0.5333	107	-	-	70-130	-	20



Serial_No:11041615:30

Matrix Spike Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG948610-3 QC Sample: L1634923-01 Client ID: MS Sample									
Boron, Total	0.006J	1	1.13	113	-	-	75-125	-	20
Calcium, Total	2.88	10	12.0	91	-	-	75-125	-	20
Iron, Total	0.112	1	1.02	91	-	-	75-125	-	20
Magnesium, Total	0.815	10	11.0	102	-	-	75-125	-	20
Potassium, Total	0.642J	10	10.5	105	-	-	75-125	-	20
Sodium, Total	10.5	10	20.9	104	-	-	75-125	-	20



Serial_No:11041615:30

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1635088
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947802-4 QC Sample: L1634447-01 Client ID: DUP Sample						
Antimony, Dissolved	0.0135	0.0126	mg/l	7		20
Arsenic, Dissolved	0.0631	0.0626	mg/l	1		20
Cadmium, Dissolved	0.0003J	0.0003J	mg/l	NC		20
Chromium, Dissolved	0.0035	0.0035	mg/l	0		20
Copper, Dissolved	0.0008J	0.0009J	mg/l	NC		20
Lead, Dissolved	ND	ND	mg/l	NC		20
Nickel, Dissolved	0.0106	0.0110	mg/l	4		20
Selenium, Dissolved	0.0358	0.0384	mg/l	7		20
Silver, Dissolved	ND	ND	mg/l	NC		20
Thallium, Dissolved	0.0007J	0.0007J	mg/l	NC		20
Zinc, Dissolved	0.0359	0.0368	mg/l	2		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947804-4 QC Sample: L1634447-01 Client ID: DUP Sample						
Iron, Dissolved	0.02J	0.02J	mg/l	NC		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG947965-4 QC Sample: L1634662-01 Client ID: DUP Sample						
Mercury, Dissolved	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG948346-4 QC Sample: L1634893-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20



Serial_No:11041615:30

Lab Duplicate Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG948609-4 QC Sample: L1634923-01 Client ID: DUP Sample					
Arsenic, Total	0.0003J	0.0004J	mg/l	NC	20
Copper, Total	0.0153	0.0123	mg/l	22 Q	20
Lead, Total	0.0004J	0.0004J	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG948610-4 QC Sample: L1634923-01 Client ID: DUP Sample					
Calcium, Total	2.88	2.92	mg/l	1	20
Iron, Total	0.112	0.113	mg/l	1	20
Magnesium, Total	0.815	0.820	mg/l	1	20
Sodium, Total	10.5	10.5	mg/l	0	20



INORGANICS & MISCELLANEOUS

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1635088-01
Client ID: INFLUENT
Sample Location: VA
Matrix: Water

Date Collected: 10/28/16 18:00
Date Received: 10/29/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	61.		mg/l	1.0	NA	1	-	11/02/16 01:17	121,2540D	MC
Chloride	170		mg/l	10	2.0	10	-	11/01/16 20:31	121,4500CL-E	ML
Nitrogen, Ammonia	0.670		mg/l	0.075	0.028	1	11/01/16 19:30	11/02/16 21:35	121,4500NH3-BH	AT
Total Organic Carbon	2.29		mg/l	2.00	0.456	4	-	11/01/16 07:07	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/31/16 17:00	10/31/16 19:00	74,1664A	ML
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/29/16 14:33	10/29/16 14:42	1,7196A	JC



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

SAMPLE RESULTS

Lab ID: L1635088-02
Client ID: EFFLUENT
Sample Location: VA
Matrix: Water

Date Collected: 10/28/16 18:00
Date Received: 10/29/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	ND		mg/l	1.0	NA	1	-	11/02/16 01:17	121,2540D	MC
Chloride	210		mg/l	10	2.0	10	-	11/01/16 20:33	121,4500CL-E	ML
Nitrogen, Ammonia	0.419		mg/l	0.075	0.028	1	11/01/16 19:30	11/02/16 21:36	121,4500NH3-BH	AT
Total Organic Carbon	0.530		mg/l	0.500	0.114	1	-	11/01/16 07:07	121,5310C	DW
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/31/16 17:00	10/31/16 19:00	74,1664A	ML
Chromium, Hexavalent	0.004	J	mg/l	0.010	0.003	1	10/29/16 14:33	10/29/16 14:43	1,7196A	JC



Project Name: DOMINION CHESTERFIELD

Lab Number: L1635088

Project Number: 14-3136

Report Date: 11/04/16

**Method Blank Analysis
Batch Quality Control**

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG947221-1										
Chromium, Hexavalent	ND		mg/l	0.010	0.003	1	10/29/16 14:33	10/29/16 14:41	1,7196A	JC
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG947666-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	4.0	1	10/31/16 17:00	10/31/16 19:00	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG947772-1										
Total Organic Carbon	ND		mg/l	0.500	0.114	1	-	11/01/16 07:07	121,5310C	DW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG948048-1										
Chloride	0.25	J	mg/l	1.0	0.20	1	-	11/01/16 20:18	121,4500CL-E	ML
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG948055-1										
Nitrogen, Ammonia	ND		mg/l	0.075	0.028	1	11/01/16 19:30	11/02/16 21:27	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG948132-1										
Solids, Total Suspended	ND		mg/l	1.0	NA	1	-	11/02/16 01:17	121,2540D	MC



Serial_No:11041615:30

Lab Control Sample Analysis
Batch Quality Control

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG947221-2								
Chromium, Hexavalent	103		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG947666-2								
Oil & Grease, Hem-Grav	85		-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG947772-2								
Total Organic Carbon	91		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG948048-2								
Chloride	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG948055-2								
Nitrogen, Ammonia	94		-		80-120	-		20



Serial_No:11041615:30

**Matrix Spike Analysis
Batch Quality Control**

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MS Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947221-3 QC Sample: L1635088-02 Client ID: EFFLUENT												
Chromium, Hexavalent	0.004J	0.1	0.111	111	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947666-4 QC Sample: L1635088-02 Client ID: EFFLUENT												
Oil & Grease, Hem-Grav	ND	40	36	90	-	-	-	-	78-114	-	-	18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947772-4 QC Sample: L1635173-01 Client ID: MS Sample												
Total Organic Carbon	14.2	40	50.9	92	-	-	-	-	80-120	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG948048-4 QC Sample: L1634967-01 Client ID: MS Sample												
Chloride	66.	20	85	95	-	-	-	-	58-140	-	-	7
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG948055-4 QC Sample: L1600011-25 Client ID: MS Sample												
Nitrogen, Ammonia	5.87	4	9.70	96	-	-	-	-	80-120	-	-	20



Serial_No:11041615:30

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1635088
Report Date: 11/04/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947221-4 QC Sample: L1635088-01 Client ID: INFLUENT						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947666-3 QC Sample: L1635088-01 Client ID: INFLUENT						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG947772-3 QC Sample: L1635173-01 Client ID: DUP Sample						
Total Organic Carbon	14.2	14.8	mg/l	4		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG948048-3 QC Sample: L1634967-01 Client ID: DUP Sample						
Chloride	66.	67	mg/l	2		7
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG948055-3 QC Sample: L1600011-25 Client ID: DUP Sample						
Nitrogen, Ammonia	5.87	5.98	mg/l	2		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG948132-2 QC Sample: L1634666-03 Client ID: DUP Sample						
Solids, Total Suspended	88.	100	mg/l	13		29



Project Name: DOMINION CHESTERFIELD

Lab Number: L1635088

Project Number: 14-3136

Report Date: 11/04/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1635088-01A	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1635088-01B	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1635088-01B1	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1635088-01C	Plastic 500ml H2SO4 preserved	A	<2	4.4	Y	Absent	NH3-4500(28)
L1635088-01D	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	HEXCR-7196(1),CL-4500(28)
L1635088-01D1	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	CL-4500(28)
L1635088-01E	Plastic 950ml unpreserved	A	7	4.4	Y	Absent	TSS-2540-LOW(7)
L1635088-01F	Amber 1000ml HCl preserved	A	N/A	4.4	Y	Absent	OG-1664(28)
L1635088-01G	Amber 1000ml HCl preserved	A	N/A	4.4	Y	Absent	OG-1664(28)
L1635088-01H	Plastic 250ml HNO3 preserved	A	<2	4.4	Y	Absent	AL-2008T(180),CD-2008T(180),CA-UI(180),NI-2008T(180),BE-2008T(180),K-UI(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),MG-UI(180),V-2008T(180),AG-2008T(180),AS-2008T(180),CO-2008T(180),HG-U(28),SE-2008T(180),B-UI(180),BA-2008T(180),MO-2008T(180),NA-UI(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1635088-01I	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	-
L1635088-01X	Plastic 120ml HNO3 preserved Fil	A	N/A	4.4	Y	Absent	AG-2008S(180),CR-2008S(180),FE-RI(180),AL-2008S(180),BE-2008S(180),K-RI(180),B-RI(180),MG-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),CO-RI(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),BA-RI(180),CA-RI(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28),MO-RI(180),NA-RI(180),V-RI(180)
L1635088-02A	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1635088-02B	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1635088-02B1	Vial H2SO4 preserved	A	N/A	4.4	Y	Absent	TOC-5310(28)
L1635088-02C	Plastic 500ml H2SO4 preserved	A	<2	4.4	Y	Absent	NH3-4500(28)
L1635088-02D	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	HEXCR-7196(1),CL-4500(28)

*Values in parentheses indicate holding time in days

Project Name: DOMINION CHESTERFIELD

Project Number: 14-3136

Lab Number: L1635088

Report Date: 11/04/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1635088-02D1	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	CL-4500(28)
L1635088-02E	Plastic 950ml unpreserved	A	7	4.4	Y	Absent	TSS-2540-LOW(7)
L1635088-02F	Amber 1000ml HCl preserved	A	N/A	4.4	Y	Absent	OG-1664(28)
L1635088-02G	Amber 1000ml HCl preserved	A	N/A	4.4	Y	Absent	OG-1664(28)
L1635088-02H	Plastic 250ml HNO3 preserved	A	<2	4.4	Y	Absent	AL-2008T(180),CD-2008T(180),CA-UI(180),NI-2008T(180),BE-2008T(180),K-UI(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),MG-UI(180),V-2008T(180),AG-2008T(180),AS-2008T(180),CO-2008T(180),HG-U(28),SE-2008T(180),B-UI(180),BA-2008T(180),MO-2008T(180),NA-UI(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1635088-02I	Plastic 250ml unpreserved	A	7	4.4	Y	Absent	-
L1635088-02X	Plastic 120ml HNO3 preserved Fil	A	N/A	4.4	Y	Absent	AG-2008S(180),CR-2008S(180),FE-RI(180),AL-2008S(180),BE-2008S(180),K-RI(180),B-RI(180),MG-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),CO-RI(180),NI-2008S(180),SE-2008S(180),TL-2008S(180),BA-RI(180),CA-RI(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28),MO-RI(180),NA-RI(180),V-RI(180)

*Values in parentheses indicate holding time in days



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: DU Report with 'J' Qualifiers



Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Project Name: DOMINION CHESTERFIELD
Project Number: 14-3136

Lab Number: L1635088
Report Date: 11/04/16

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: **EPA 3050B**

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

 NEW JERSEY CHAIN OF CUSTODY Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193	Service Centers Mahwah, NJ 07430: 35 Whitney Rd, Suite 5 Albany, NY 12205: 14 Walker Way Tonawanda, NY 14150: 275 Cooper Ave, Suite 105	Page	Date Rec'd in Lab <i>10/29/16</i>	ALPHA Job # <i>L1635088</i>											
		of 1													
Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288	Project Information Project Name: <i>DOMINION CHESTARFIELD</i> Project Location: <i>VA</i> Project # <i>14-3136</i> (Use Project name as Project #) <input checked="" type="checkbox"/>		Deliverables <input type="checkbox"/> NJ Full / Reduced <input type="checkbox"/> EQUIS (1 File) <input type="checkbox"/> EQUIS (4 File) <input type="checkbox"/> Other	Billing Information <input checked="" type="checkbox"/> Same as Client Info PO #											
Client Information Client: <i>GLWT</i> Address: <i>627 Mt Hope Rd</i> <i>Weston, NJ 07885</i> Phone: <i>973 800 3531</i> Fax: <i>973 983 0903</i> Email: <i>carlson@glwtllc.com</i>	Project Manager: <i>JIM CARLSON</i> ALPHAQuote #: Turn-Around Time Standard <input type="checkbox"/> Due Date: Rush (only if pre approved) <input type="checkbox"/> # of Days:	Regulatory Requirement <input type="checkbox"/> SRS Residential/Non Residential <input type="checkbox"/> SRS Impact to Groundwater <input type="checkbox"/> NJ Ground Water Quality Standards <input type="checkbox"/> NJ IGW SPLP Leachate Criteria <input checked="" type="checkbox"/> Other <i>VADEQ</i>	Site Information Is this site impacted by Petroleum? Yes <input type="checkbox"/> Petroleum Product:												
These samples have been previously analyzed by Alpha <input type="checkbox"/>		ANALYSIS			Sample Filtration <input type="checkbox"/> Done <input checked="" type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)										
For EPH, selection is REQUIRED: <input type="checkbox"/> Category 1 <input type="checkbox"/> Category 2	For VOC, selection is REQUIRED: <input type="checkbox"/> 1,4-Dioxane <input type="checkbox"/> 8011	Other project specific requirements/comments: <i>Metals by 200.8</i> Please specify Metals or TAL: <i>Sb, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Tl, Zn</i> <i>Mo, Ba, Co, Bi, V, Al, Be, Na, Ca, K, Hg</i>			TOX AMMONIA CHLORIDE TSS TOTAL METALS DISSOLVED METALS CHG/IGW HEX CC	Sample Specific Comments									
ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	TOX	AMMONIA	CHLORIDE	TSS	TOTAL METALS	DISSOLVED METALS	CHG/IGW	HEX CC	Sample Specific Comments	Total Bottles
<i>35088-01</i>	<i>INFLUENT 102816</i>	<i>10/28/16</i>	<i>1800</i>	<i>WW</i>	<i>RMD</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>SAMPLED 102816</i>	<i>16</i>
<i>-02</i>	<i>EFFLUENT 102816</i>	<i>10/28/16</i>	<i>1800</i>	<i>WW</i>	<i>RMD</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>SAMPLED 102816</i>	<i>16</i>
Preservative Code: A = None B = HCl C = HNO ₃ D = H ₂ SO ₄ E = NaOH F = MeOH G = NaHSO ₄ H = Na ₂ S ₂ O ₃ K/E = Zn Ac/NaOH O = Other		Container Code: P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOD Bottle		Westboro: Certification No: MA935 Mansfield: Certification No: MA015		Container Type: <i>V P P P P P A</i> Preservative: <i>D D A A C A B</i>		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)							
Form No: 01-14 HC (rev. 30-Sept-2013)		Relinquished By: <i>[Signature]</i>		Date/Time: <i>10/28/16/1800</i>		Received By: <i>[Signature]</i>		Date/Time: <i>10/29/16/09:57</i>							

Contact: Rob Orlandi

ORIGIN ID: 323 989-9901
GROUNDWATER BENT & TECH
627 MOUNT H. RD
MARTON, NJ 0858007
UNITED STATES

SHIP DATE: 28OCT16
ACT WT: 47.40 LB
CFO: /OFFC:722
DIMS: 24x14x14 IN
BILL SENDER

TO SAMPLES RECEIVING
ALPHA ANALYTICAL INC
8 WALKUP DR

WESTBOROUGH MA1581

(509) 898-9220 REF: 11041615



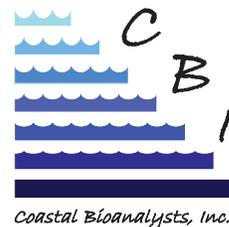
SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 8029 9642 3041

X0 BBFA

01581
A-US BOS





Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To: Mr. Rob Orlando Ground/Water Treatment & Technology LLC 627 Mount Hope Road Wharton, NJ 07885	Prepared By: Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director
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Acute Test Results*				
Species-Test Method	48-h LC50	95% C.L.	T.U. _{Ac}	NOAEC
<i>C. dubia</i> EPA 2002.0	>100	N/A	1.00	100
<i>P. promelas</i> EPA 2000.0	>100	N/A	1.00	100

For each test method record the T.U._{Ac} value (bold) on the DMR.

Chronic Test Results*										
Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	T.U. _C	IC25	48-h LC50	LC50 95% C.L.	T.U. _A
<i>C. dubia</i> EPA 1002.0	Survival	100	>100	>100	N/A	1.00	N/A	>100	N/A	<1.00
	Reproduction	100	>100	>100	19	1.00	>100	N/A	N/A	N/A
<i>P. promelas</i> EPA 1000.0	Survival	100	>100	>100	N/A	1.00	N/A	>100	N/A	<1.00
	Biomass	48.0	74.0	59.6	15	2.08	75.5	N/A	N/A	N/A

*Details regarding test conduct and data analysis provided in attached bench sheets and printouts.

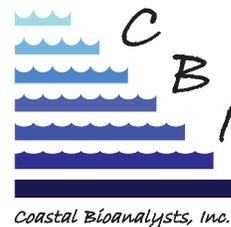
For each test method record the highest endpoint T.U._c value (bold) on the DMR.

Acute Test QA/QC		Reference Toxicant: KCl		Units: mg/l	Test Organism Source: CBI Stock Cultures	
Species-Method (Ref. Test Date)	Data Source	% Control Survival	48-h LC50	95% C.L./A.L. For LC50	RTT in Control?	
<i>C. dubia</i> 2002.0 (10/10/16-10/12/16)	RTT	100	518	480-558	Yes	
	CC	100	534	423-646		
<i>P. promelas</i> 2000.0 (10/10/16-10/12/16)	RTT	100	1071	1000-1148	Yes	
	CC	100	1038	888-1187		

Chronic Test QA/QC		Reference Toxicant: KCl		Units: mg/l	Test Organism Source: CBI Stock Cultures				
Species-Method (Ref. Test Date)	Data Source	% Survival		Reproduction (# Young) or Biomass (mg)				RTT in Control?	
		Cont.	NOEC	Cont.	NOEC	PMSD	IC25		IC25 A.L.
<i>C. dubia</i> 1002.0 (10/1/16-10/7/16)	RTT	100	250	23.1	250	29	330	N/A	Yes
	CC	100	500	25.0	250	21	329	274-385	
<i>P. promelas</i> 1000.0 (9/30/16-10/7/16)	RTT	100	500	0.66	500	12	659	N/A	Yes
	CC	99	500	0.61	500	13	622	585-659	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.





The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean ± 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac} = 100/LC50$. $T.U._{Chr} = 100/NOEC$. A dimensionless unit.



C. dubia daily biological measurements (EPA 2002.0) Template version ACD-STAT-5trt-061113

TRTMNT (% Effl)	Rep	#Live Day 0	#Live Day 1	#Live Day 2	Final Mean % Live		
C	A	5	5	5	100.0		
	B	5	5	5			
Lab	C	5	5	5			
Control	D	5	5	5			
#1	A	5	5	5	100.0		
6.25	B	5	5	5			
% Effl	C	5	5	5			
	D	5	5	5			
# 2	A	5	5	5	100.0		
12.5	B	5	5	5			
% Effl	C	5	5	5			
	D	5	5	5			
# 3	A	5	5	5	100.0		
25.0	B	5	5	5			
% Effl	C	5	5	5			
	D	5	5	5			
# 4	A	5	5	5	100.0		
50.0	B	5	5	5			
% Effl	C	5	5	5			
	D	5	5	5			
# 5	A	5	5	5	100.0		
100	B	5	5	5			
% Effl	C	5	5	5		Test Duration: 47h 52m	
	D	5	5	5		TAC 48+/-0.5h	
INITIALS:		AG	RCD	RCD	% CONTROL SURVIVAL:	100.0	
DATE & TIME:		10/27/16 15:38	10/28/16 9:54	10/29/16 15:30		TAC = 90%	
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)							
SPECIES:	Ceriodaphnia dubia						
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater						
FEEDING PRIOR TO TEST:	YCT + Selenastrum capricornutum						
FEEDING DURING TEST:	None -YCT + Selenastrum 2+ h before test						
SOURCE:	CBI Stock cultures						
ACCLIMATION TEMP (o C):	25						
BROOD RELEASE START DATE & TIME:	10/26/16 17:30						
BROOD RELEASE END DATE & TIME:	10/27/16 9:25						
DATE/TIME WATER ADDED:	10/27/16 15:13						
DATE/TIME ANIMALS ADDED:	10/27/16 15:38						
ANIMAL AGE WINDOW:	15h 55m						
MAX AGE AT TEST START:	22h 8m					TAC Max. 24 h	
TEST SET UP BY:	AG						
SAMPLE COLLECTION DATE & TIME:	10/26/16 18:00	SAMPLE USED:	B				
TEST ID:	SAMPLE AGE AT TEST START:					21h 38m TAC Max 36 h	
GWTT1601ACD	PEER REVIEW BY (INITIALS/DATE):					PB 11/3/16 12:25	

Ceriodaphnia daily water quality bench sheet (EPA METHOD 2002.0) Template version ACD-STAT-5trt-061113

	TRTMNT	Day 0 Initial	Day 1	Day 2 Final	SUMMARY WATER QUALITY DATA			
					MEAN	S.D.	MIN.	MAX.
pH (S.U.)	C	7.76	7.93	7.86	7.85	0.09	7.76	7.93
	1	7.75	7.93	7.86	7.85	0.09	7.75	7.93
	2	7.73	7.90	7.80	7.81	0.09	7.73	7.90
	3	7.70	7.86	7.83	7.80	0.09	7.70	7.86
	4	7.65	7.79	7.77	7.74	0.08	7.65	7.79
	5	7.53	7.61	7.59	7.58	0.04	7.53	7.61
Temp. (°C)	C	26	25	25	25	0.6	25	26
	1	26	25	25	25	0.6	25	26
	2	26	25	25	25	0.6	25	26
	3	26	25	25	25	0.6	25	26
	4	26	25	25	25	0.6	25	26
	5	26	25	25	25	0.6	25	26
Diss. Oxygen (mg/l)	C	8.1	8.0	8.0	8.0	0.1	8.0	8.1
	1	8.1	8.0	8.0	8.0	0.1	8.0	8.1
	2	8.1	8.0	8.1	8.1	0.1	8.0	8.1
	3	8.1	8.0	8.0	8.0	0.1	8.0	8.1
	4	8.1	8.0	8.0	8.0	0.1	8.0	8.1
	5	8.1	8.0	8.0	8.0	0.1	8.0	8.1
Cond. (uS/cm)	C	302		297	300	3.5	297	302
	1	335			335		335	335
	2	369			369		369	369
	3	435			435		435	435
	4	567			567		567	567
	5	824			784	804	28.3	784	824
Replicate measured		Flask	Surrogate	A				
Initials		AG	RCD	RCD				
TRC (mg/l) in highest conc. at end of test:				N/A				
Changes & Notes (Initials, date, specific change or notes)								
		Test chamber:	30 ml glass vial:	<input checked="" type="checkbox"/>				
		Other:						
		Test solution vol. (15 ml min):	15 ml:	<input checked="" type="checkbox"/>				
		Other (ml):						
		Illumination & photoperiod:	50-100 ft-c 16L:8D	Template Number:	23			
		Number of replicates/treatment:	4					
		Initial number animals/replicate:	5					
		Test Aerated?	N/A	Date & Time Air Start:	N/A			
TEST ID	TRT ID:	1	2	3	4	5		
GWTT1601ACD	CONC(%):	6.25	12.5	25.0	50.0	100		

P. promelas daily biological measurements (EPA 2000.0) Template version APP-STAT-48h-NOAEC5-061113

TRTMNT (%Effl)	Rep	#Live Day 0	#Live Day 1	#Live Day 2	Final Mean % Live		
	A	5	5	5	100.0		
C	B	5	5	5			
Lab Control	C	5	5	5			
	D	5	5	5			
	A	5	5	5	100.0		
#1	B	5	5	5			
6.25	C	5	5	5			
	D	5	5	5			
	A	5	5	5	100.0		
# 2	B	5	5	5			
12.5	C	5	5	5			
	D	5	5	5			
	A	5	5	5	100.0		
# 3	B	5	5	5			
25.0	C	5	5	5			
	D	5	5	5			
	A	5	5	5	100.0		
# 4	B	5	5	5			
50.0	C	5	5	5			
	D	5	5	5			
	A	5	5	5	95.0		
# 5	B	5	5	5			
100	C	5	5	4		Test Duration:	47h 40m
	D	5	5	5		TAC 48+/-0.5h	
INITIALS:		AG	RCD	RCD	% CONTROL SURVIVAL:	100.0	
DATE & TIME:		10/27/16 15:49	10/28/16 9:52	10/29/16 15:28		TAC = 90%	
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)							
SPECIES:		Pimephales promelas					
ACCLIMATION WATER:		Mod. Hard Synthetic Freshwater					
FEEDING PRIOR TO TEST:		Artemia nauplii ad libitum					
FEEDING DURING TEST:		None					
SOURCE:		CBI Stock cultures					
ACCLIMATION TEMP (o C):		25					
HATCH START DATE & TIME:		10/19/16 17:00					
HATCH END DATE & TIME:		10/20/16 10:30					
DATE/TIME WATER ADDED:		10/27/16 15:13					
DATE/TIME ANIMALS ADDED:		10/27/16 15:49					
ANIMAL AGE WINDOW:		17h 30m				TAC Max. 24 h	
MAX AGE AT TEST START:		8d				TAC Max. 14 d	
TEST SET UP BY:						AG	
SAMPLE COLLECTION DATE & TIME:		10/26/16 18:00		SAMPLE USED		B	
TEST ID:		SAMPLE AGE AT TEST START:		21h 49m		TAC MAX 36 h	
GWTT1601APP		PEER REVIEW BY (INITIALS/DATE):				PB 11/3/16 12:26	

P. promelas daily water quality sheet (EPA METHOD 2002.0) Template version APP-STAT-48h-NOAEC5-061113

	TRTMNT	Day 0 Initial	Day 1	Day 2 Final	SUMMARY WATER QUALITY DATA				
					MEAN	S.D.	MIN.	MAX.	
pH (S.U.)	C	7.76	7.72	7.87	7.78	0.08	7.72	7.87	
	1	7.75	7.76	7.80	7.77	0.03	7.75	7.80	
	2	7.73	7.72	7.75	7.73	0.02	7.72	7.75	
	3	7.70	7.69	7.73	7.71	0.02	7.69	7.73	
	4	7.65	7.64	7.63	7.64	0.01	7.63	7.65	
	5	7.53	7.54	7.52	7.53	0.01	7.52	7.54	
Temp. (°C)	C	26	25	25	25	0.6	25	26	
	1	26	25	25	25	0.6	25	26	
	2	26	25	25	25	0.6	25	26	
	3	26	25	25	25	0.6	25	26	
	4	26	25	25	25	0.6	25	26	
	5	26	25	25	25	0.6	25	26	
Diss. Oxygen (mg/l)	C	8.1	7.8	7.8	7.9	0.2	7.8	8.1	
	1	8.1	7.8	7.7	7.9	0.2	7.7	8.1	
	2	8.1	7.8	7.6	7.8	0.3	7.6	8.1	
	3	8.1	7.8	7.7	7.9	0.2	7.7	8.1	
	4	8.1	7.8	7.7	7.9	0.2	7.7	8.1	
	5	8.1	7.8	7.7	7.9	0.2	7.7	8.1	
Cond. (µS/cm)	C	302		309	306	4.9	302	309	
	1	335			335		335	335	
	2	369			369		369	369	
	3	435			435		435	435	
	4	567			567		567	567	
	5	824		814	819	7.1	814	824	
Replicate measured		D	B	A					
Initials		AG	RCD	RCD					
TRC (mg/l) in highest conc. at end of test:				N/A					
Changes & Notes (Initials, date, specific change or notes)									
		Test chamber: 400 ml Tri-pour bkr:		<input checked="" type="checkbox"/>					
		Other:							
		Test solution vol. (200 ml min): 200 ml:		<input checked="" type="checkbox"/>					
		Other (ml):							
		Illumination & photoperiod:		50-100 ft-c 16L:8D					
		Number of replicates/treatment:		4					
		Initial number animals/replicate:		5					
		Test Aerated?		No			Date & Time Air Start:		
TEST ID	TRT ID:	1	2	3	4	5	D.O. Highest conc. @ aeration:		
GWTT1601APP	CONC (%):	6.25	12.5	25.0	50.0	100	Total live highest conc.@ aeration		

Acute Fish Test-48 Hr Survival

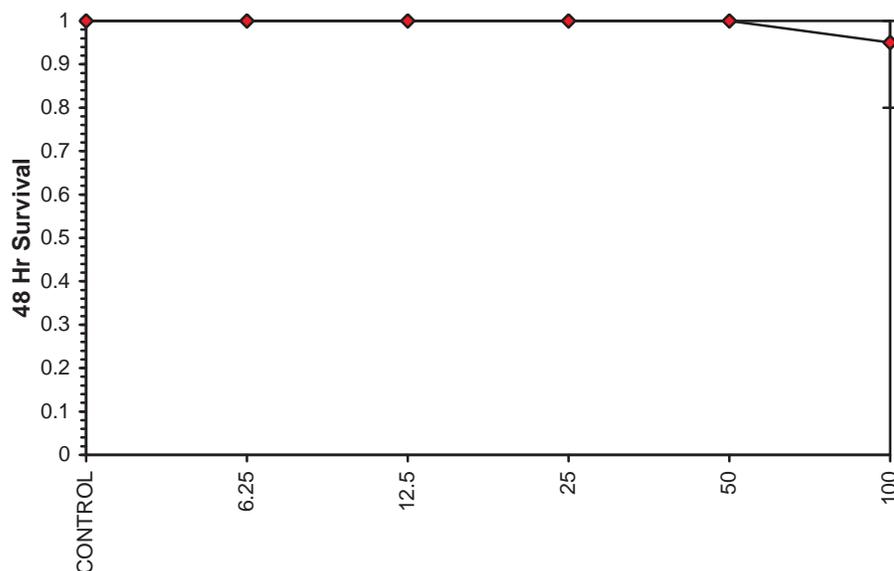
Start Date: Test ID: GWTT1601AP Sample ID:
 End Date: Lab ID: CBI Sample Type:
 Sample Date: Protocol: EPAA 91-EPA Acute Test Species: PP-Pimephales promelas
 Comments: DATA ENTERED BY PB

Conc-%	1	2	3	4
CONTROL	1.0000	1.0000	1.0000	1.0000
6.25	1.0000	1.0000	1.0000	1.0000
12.5	1.0000	1.0000	1.0000	1.0000
25	1.0000	1.0000	1.0000	1.0000
50	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	0.8000	1.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
CONTROL	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4		
6.25	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00
12.5	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00
25	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00
50	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00
100	0.9500	0.9500	1.2857	1.1071	1.3453	9.261	4	16.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01) Equality of variance cannot be confirmed	0.46508	0.884	-3.0206	13.9892
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1

Dose-Response Plot



Ceriodaphnia test set up bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

Test chamber:	~30 ml glass vial:	<input checked="" type="checkbox"/>	Illumination & photoperiod:	50-100 ft-c 16L:8D		
	Other:		Number of replicates/treatment:	10		
Test solution volume:	15 ml:	<input checked="" type="checkbox"/>	Initial number animals/replicate:	1		
	Other (ml):		Template #:	10		
<table border="1"> <tr> <td style="width: 20%;">CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)</td> <td></td> </tr> </table>					CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)	
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)						

SPECIES:	Ceriodaphnia dubia
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater
FEEDING (Culture & Test):	YCT + Selenastrum capricornutum mix
SOURCE:	CBI Stock cultures
ACCLIMATION TEMP (°C):	25
BROOD RELEASE FROM:	10/25/16 14:45
BROOD RELEASE TO:	10/25/16 17:10
DATE/TIME WATER ADDED:	10/26/16 14:30
DATE/TIME ANIMALS ADDED:	10/26/16 14:38
ANIMAL AGE WINDOW (TAC 8 h):	2h 25m
MAX AGE AT TEST START (TAC 24 h):	23h 53m
TEST SET UP BY:	PB
TEST ID:	GWTT1601CCD
PEER REVIEW BY (Initial/Date):	GB. PB 11/1/16 15:28
GWTT1601CCD	

Ceriodaphnia daily reproduction count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	Repro Day 0	Repro Day 1	Repro Day 2	Repro Day 3	Repro Day 4	Repro Day 5	Repro Day 6	Repro Day 7	4th Broods Removed	TOTAL REPRO		
A		0	0	0	4	10	0	14			28		
C		0	0	0	3	8	0	12			23		
B		0	0	0	5	8	14	0			27		
Lab	D	0	0	0	4	10	0	12			26		
Control	E	0	0	0	5	12	0	10			27		
	F	0	0	0	4	10	0	12			26		
	G	0	0	0	5	10	0	0			15		
	H	0	0	0	3	10	0	14			27		
	I	0	0	0	4	12	0	16			32		
	J	0	0	0	4	10	16	0			30		
	A	0	0	0	5	14	0	16			35		
#1	B	0	0	0	5	10	20	0			35		
	C	0	0	0	2	10	0	14			26	SAMPLE COLLECTION	
11.0%	D	0	0	0	4	10	0	14			28		
	E	0	0	0	0	6	0	12			18	SAMPLE	COLLECTION DATE & TIME
Vol. Effl:	F	0	0	0	3	10	0	14			27		
22 ml	G	0	0	0	6	8	0	14			28	A	10/25/16 18:00
	H	0	0	0	3	12	0	16			31	B	10/26/16 18:00
	I	0	0	0	1	8	0	14			23	C	10/29/16 15:00
	J	0	0	0	5	8	14	0			27	D	
	A	0	0	0	5	10	0	12			27	E	
# 2	B	0	0	0	2	10	20	0			32		
	C	0	0	0	2	10	0	14			26	SAMPLE AGING	
23.0%	D	0	0	0	4	8	0	12			24		
	E	0	0	0	5	10	0	14			29	SAMPLE:	A
Vol. Effl:	F	0	0	0	4	10	0	16			30	1st USE DATE/TIME:	10/26/16 14:38
46 ml	G	0	0	0	2	10	0	12			24	LAST USE DATE/TIME:	10/26/16 14:38
	H	0	0	0	3	12	0	14			29	TIME COLLECT TO 1st USE:	20h 38m
	I	0	0	0	3	10	0	16			29		(TAC 36 h max)
	J	0	0	0	4	12	14	0			30	TIME 1st TO LAST USE:	0h 0m
	A	0	0	0	4	10	0	18			32		(TAC MAX 72 h)
# 3	B	0	0	0	3	8	16	0			27		
	C	0	0	0	3	2	10	16		16	15	SAMPLE:	B
48.0%	D	0	0	0	3	10	0	16			29	1st USE DATE/TIME:	10/27/16 14:08
	E	0	0	0	5	12	0	16			33	LAST USE DATE/TIME:	10/29/16 15:14
Vol. Effl:	F	0	0	0	3	8	0	14			25	TIME COLLECT TO 1st USE:	20h 8m
96 ml	G	0	0	0	3	10	0	12			25		(TAC 36 h max)
	H	0	0	0	5	12	0	14			31	TIME 1st TO LAST USE:	49h 6m
	I	0	0	0	3	14	0	14			31		(TAC MAX 72 h)
	J	0	0	0	4	8	18	0			30		
	A	0	0	0	3	12	0	14			29	SAMPLE:	C
# 4	B	0	0	0	5	4	18	0			27	1st USE DATE/TIME:	10/30/16 16:05
	C	0	0	0	5	10	0	14			29	LAST USE DATE/TIME:	10/31/16 12:59
74.0%	D	0	0	0	4	10	0	12			26	TIME COLLECT TO 1st USE:	25h 5m
	E	0	0	0	4	12	0	16			32		(TAC 36 h max)
Vol. Effl:	F	0	0	0	4	10	0	14			28	TIME 1st TO LAST USE:	20h 54m
148 ml	G	0	0	0	4	8	0	14			26		(TAC MAX 72 h)
	H	0	0	0	2	10	0	10			22		
	I	0	0	0	4	12	0	0			16	SAMPLE:	D
	J	0	0	0	4	10	14	0			28	1st USE DATE/TIME:	
	A	0	0	0	3	12	0	16			31	LAST USE DATE/TIME:	
# 5	B	0	0	0	4	10	0	14			28	TIME COLLECT TO 1st USE:	0
	C	0	0	0	3	10	0	14			27		(TAC 36 h max)
100%	D	0	0	0	2	5	0	12			19	TIME 1st TO LAST USE:	0
	E	0	0	0	3	8	0	0			11		(TAC MAX 72 h)
Vol. Effl:	F	0	0	0	5	8	0	8			21		
200 ml	G	0	0	0	2	10	0	14			26	SAMPLE:	E
	H	0	0	0	5	8	0	12			25	1st USE DATE/TIME:	
	I	0	0	0	6	12	0	12			30	LAST USE DATE/TIME:	
	J	0	0	0	2	8	14	0			24	TIME COLLECT TO 1st USE:	0
INITIALS:	PB	AG	RCD	GB	AG	AG	GB						(TAC 36 h max)
DATE & TIME:	10/26/16 14:38	10/27/16 14:08	10/28/16 13:28	10/29/16 15:14	10/30/16 16:05	10/31/16 12:59	11/1/16 15:20					TIME 1st TO LAST USE:	0
SAMPLE USED:	A	B	B	B	C	C							(TAC MAX 72 h)
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)													
GWTT1601CCD	Avg. young/surviving control (TAC 15 min):			26.1	Surv. controls with 3 broods:		9						

Ceriodaphnia daily survival count bench sheet (EPA METHOD 1002.0) Template version CCD 5trt 061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live FINAL	MALE OR FEMALE	TOTAL REPRO	REPRO/SURV FEM
	A	1	1	1	1	1	1	1	1	F	28	28
C	B	1	1	1	1	1	1	1	1	F	23	23
	C	1	1	1	1	1	1	1	1	F	27	27
Lab	D	1	1	1	1	1	1	1	1	F	26	26
Control	E	1	1	1	1	1	1	1	1	F	27	27
	F	1	1	1	1	1	1	1	1	F	26	26
	G	1	1	1	1	1	1	1	1	F	15	15
	H	1	1	1	1	1	1	1	1	F	27	27
	I	1	1	1	1	1	1	1	1	F	32	32
	J	1	1	1	1	1	1	1	1	F	30	30
	A	1	1	1	1	1	1	1	1	F	35	
#1	B	1	1	1	1	1	1	1	1	F	35	
	C	1	1	1	1	1	1	1	1	F	26	
11.0%	D	1	1	1	1	1	1	1	1	F	28	
	E	1	1	1	1	1	1	1	1	F	18	
	F	1	1	1	1	1	1	1	1	F	27	
	G	1	1	1	1	1	1	1	1	F	28	
	H	1	1	1	1	1	1	1	1	F	31	
	I	1	1	1	1	1	1	1	1	F	23	
	J	1	1	1	1	1	1	1	1	F	27	
	A	1	1	1	1	1	1	1	1	F	27	
# 2	B	1	1	1	1	1	1	1	1	F	32	
	C	1	1	1	1	1	1	1	1	F	26	
23.0%	D	1	1	1	1	1	1	1	1	F	24	
	E	1	1	1	1	1	1	1	1	F	29	
	F	1	1	1	1	1	1	1	1	F	30	
	G	1	1	1	1	1	1	1	1	F	24	
	H	1	1	1	1	1	1	1	1	F	29	
	I	1	1	1	1	1	1	1	1	F	29	
	J	1	1	1	1	1	1	1	1	F	30	
	A	1	1	1	1	1	1	1	1	F	32	
# 3	B	1	1	1	1	1	1	1	1	F	27	
	C	1	1	1	1	1	1	1	1	F	15	
48.0%	D	1	1	1	1	1	1	1	1	F	29	
	E	1	1	1	1	1	1	1	1	F	33	
	F	1	1	1	1	1	1	1	1	F	25	
	G	1	1	1	1	1	1	1	1	F	25	
	H	1	1	1	1	1	1	1	1	F	31	
	I	1	1	1	1	1	1	1	1	F	31	
	J	1	1	1	1	1	1	1	1	F	30	
	A	1	1	1	1	1	1	1	1	F	29	
# 4	B	1	1	1	1	1	1	1	1	F	27	
	C	1	1	1	1	1	1	1	1	F	29	
74.0%	D	1	1	1	1	1	1	1	1	F	26	
	E	1	1	1	1	1	1	1	1	F	32	
	F	1	1	1	1	1	1	1	1	F	28	
	G	1	1	1	1	1	1	1	1	F	26	
	H	1	1	1	1	1	1	1	1	F	22	
	I	1	1	1	1	1	1	1	1	F	16	
	J	1	1	1	1	1	1	1	1	F	28	
	A	1	1	1	1	1	1	1	1	F	31	
# 5	B	1	1	1	1	1	1	1	1	F	28	
	C	1	1	1	1	1	1	1	1	F	27	
100%	D	1	1	1	1	1	1	1	1	F	19	
	E	1	1	1	1	1	1	1	1	F	11	
	F	1	1	1	1	1	1	1	1	F	21	
	G	1	1	1	1	1	1	1	1	F	26	
	H	1	1	1	1	1	1	1	1	F	25	
	I	1	1	1	1	1	1	1	1	F	30	
	J	1	1	1	1	1	1	1	1	F	24	
See Reproduction Sheet for Renewal Information						See ToxCalc printout for summary survival & reproduction data						
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)												
GWTT1601CCD		% Control survival (TAC 80% min):			100			% Surviving controls with 3 broods (TAC 60% min):			90	

Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: Test ID: GWTT1601CD Sample ID:
 End Date: Lab ID: CBI Sample Type:
 Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: CD-Ceriodaphnia dubia
 Comments: DATA ENTERED BY PB

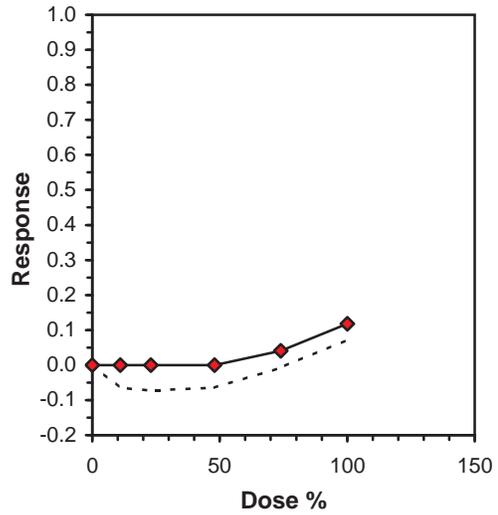
Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	28.000	23.000	27.000	26.000	27.000	26.000	15.000	27.000	32.000	30.000
11	35.000	35.000	26.000	28.000	18.000	27.000	28.000	31.000	23.000	27.000
23	27.000	32.000	26.000	24.000	29.000	30.000	24.000	29.000	29.000	30.000
48	32.000	27.000	15.000	29.000	33.000	25.000	25.000	31.000	31.000	30.000
74	29.000	27.000	29.000	26.000	32.000	28.000	26.000	22.000	16.000	28.000
100	31.000	28.000	27.000	19.000	11.000	21.000	26.000	25.000	30.000	24.000

Conc-%	Mean	N-Mean	Transform: Untransformed					Rank Sum	1-Tailed Critical	Isotonic	
			Mean	Min	Max	CV%	N			Mean	N-Mean
CONTROL	26.100	1.0000	26.100	15.000	32.000	17.553	10			27.425	1.0000
11	27.800	1.0651	27.800	18.000	35.000	18.482	10	115.50	75.00	27.425	1.0000
23	28.000	1.0728	28.000	24.000	32.000	9.524	10	118.00	75.00	27.425	1.0000
48	27.800	1.0651	27.800	15.000	33.000	19.019	10	119.00	75.00	27.425	1.0000
74	26.300	1.0077	26.300	16.000	32.000	16.914	10	109.00	75.00	26.300	0.9590
100	24.200	0.9272	24.200	11.000	31.000	24.547	10	94.50	75.00	24.200	0.8824

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)	1.15599	1.035	-1.1174	1.46939
Bartlett's Test indicates equal variances (p = 0.36)	5.47242	15.0863		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1

Linear Interpolation (200 Resamples)

Point	%	SD	95% CL	Skew
IC05	77.049			
IC10	94.026			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



Ceriodaphnia Survival and Reproduction Test-Reproduction

Start Date: Test ID: GWTT1601CD Sample ID:
 End Date: Lab ID: CBI Sample Type:
 Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: CD-Ceriodaphnia dubia
 Comments: DATA ENTERED BY PB

Conc-%	1	2	3	4	5	6	7	8	9	10
CONTROL	28.000	23.000	27.000	26.000	27.000	26.000	15.000	27.000	32.000	30.000
11	35.000	35.000	26.000	28.000	18.000	27.000	28.000	31.000	23.000	27.000
23	27.000	32.000	26.000	24.000	29.000	30.000	24.000	29.000	29.000	30.000
48	32.000	27.000	15.000	29.000	33.000	25.000	25.000	31.000	31.000	30.000
74	29.000	27.000	29.000	26.000	32.000	28.000	26.000	22.000	16.000	28.000
100	31.000	28.000	27.000	19.000	11.000	21.000	26.000	25.000	30.000	24.000

Conc-%	Mean	N-Mean	Transform: Untransformed					N	t-Stat	1-Tailed	
			Mean	Min	Max	CV%	Critical			MSD	
CONTROL	26.100	1.0000	26.100	15.000	32.000	17.553	10				
11	27.800	1.0651	27.800	18.000	35.000	18.482	10	-0.794	2.287	4.896	
23	28.000	1.0728	28.000	24.000	32.000	9.524	10	-0.887	2.287	4.896	
48	27.800	1.0651	27.800	15.000	33.000	19.019	10	-0.794	2.287	4.896	
74	26.300	1.0077	26.300	16.000	32.000	16.914	10	-0.093	2.287	4.896	
100	24.200	0.9272	24.200	11.000	31.000	24.547	10	0.887	2.287	4.896	

Auxiliary Tests			Statistic	Critical	Skew	Kurt						
Kolmogorov D Test indicates non-normal distribution (p <= 0.01)			1.15599	1.035	-1.1174	1.46939						
Bartlett's Test indicates equal variances (p = 0.36)			5.47242	15.0863								
Hypothesis Test (1-tail, 0.05)			NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test			100	>100		1	4.89605	0.18759	21.76	22.9222	0.45701	5, 54

Dunnett's test for PMSD only

Fathead minnow test set up bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

Test chamber:	1000 ml Poly Beaker	<input checked="" type="checkbox"/>	Illumination & photoperiod:	50-100 ft-c 16L:8D
	Other:		Number of replicates/treatment:	4
Test solution vol. (250 ml min):	500 ml:	<input type="checkbox"/>	Initial number animals/replicate:	10
	Other (ml):	250 ml		
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)				

SPECIES:	Pimephales promelas	
ACCLIMATION WATER:	Mod. Hard Synthetic Freshwater	
FEEDING PRIOR TO TEST:	Artemia nauplii (<24 h old) ad libitum	
FEEDING DURING TEST:	Artemia nauplii (<24 h old, ~0.15 ml) 2x/day	
SOURCE:	CBI Stock cultures	
ACCLIMATION TEMP (°C):	25	
HATCH START DATE & TIME:	10/25/16 17:00	
HATCH END DATE & TIME:	10/26/16 10:00	
DATE/TIME WATER ADDED:	10/26/16 14:47	
DATE/TIME ANIMALS ADDED:	10/26/16 14:57	
ANIMAL AGE WINDOW:	17h 0m	
MAX AGE AT TEST START (TAC 24 h MAX):	21h 58m	
TEST SET UP BY:	GB	
TEST ID:	GWTT1601CPP	
PEER REVIEW BY (Initial/Date):	PB. GB	11/3/16 13:42
GWTT1601CPP		

Fathead minnow daily water quality bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

	TRTMNT	Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		SUMMARY WATER QUALITY DATA			
		Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	MEAN	S.D.	MIN.	MAX.		
pH (S.U.)	C	7.93	7.67	7.66	7.43	7.59	7.49	7.66	7.61	7.67	7.55	7.63	7.65	7.66	7.25	7.60	0.15	7.25	7.93		
	1	7.95	7.67	7.63	7.43	7.60	7.43	7.62	7.49	7.62	7.50	7.62	7.49	7.61	7.15	7.56	0.18	7.15	7.95		
	2	7.95	7.65	7.61	7.50	7.57	7.36	7.64	7.46	7.68	7.48	7.60	7.42	7.58	7.16	7.55	0.18	7.16	7.95		
	3	7.96	7.65	7.58	7.43	7.54	7.31	7.51	7.39	7.63	7.42	7.56	7.39	7.55	7.13	7.50	0.19	7.13	7.96		
	4	7.98	7.65	7.56	7.41	7.46	7.32	7.50	7.38	7.63	7.39	7.56	7.34	7.50	7.13	7.49	0.20	7.13	7.98		
	5	8.06	7.68	7.55	7.41	7.46	7.26	7.48	7.44	7.60	7.44	7.55	7.31	7.47	7.14	7.49	0.21	7.14	8.06		
Temp. (o C)	C	25	25	25	25	25	25	25	25	26	25	26	24	25	25	25	0.5	24	26		
	1	25	25	25	25	25	25	25	25	26	25	26	24	25	25	25	0.5	24	26		
	2	25	25	25	25	25	25	25	25	26	25	26	24	25	25	25	0.5	24	26		
	3	25	25	25	25	25	25	25	25	26	25	26	24	25	25	25	0.5	24	26		
	4	25	25	25	25	25	25	25	25	26	25	26	24	25	25	25	0.5	24	26		
	5	25	25	25	25	25	25	25	25	26	25	26	24	25	25	25	0.5	24	26		
Diss. Oxygen (mg/l)	C	8.2	7.8	7.8	6.9	8.0	7.3	7.5	7.3	7.5	6.8	7.2	6.8	7.8	6.5	7.4	0.5	6.5	8.2		
	1	8.2	7.7	7.7	6.8	7.8	7.3	7.5	7.1	7.4	6.8	7.2	6.7	7.8	6.5	7.3	0.5	6.5	8.2		
	2	8.2	7.7	7.7	6.9	7.8	7.2	7.5	6.8	7.3	6.9	7.3	6.7	7.7	6.4	7.3	0.5	6.4	8.2		
	3	8.2	7.5	7.8	6.9	7.8	7.1	7.3	6.8	7.5	6.9	7.3	6.7	7.7	6.5	7.3	0.5	6.5	8.2		
	4	8.2	7.6	7.7	6.9	7.8	7.2	7.6	7.0	7.6	6.9	7.6	6.7	7.6	6.4	7.3	0.5	6.4	8.2		
	5	8.2	7.7	7.8	7.0	7.8	7.2	7.8	7.4	7.7	7.0	7.7	6.6	7.6	6.4	7.4	0.5	6.4	8.2		
Cond. (uS/cm)	C	300		301		311		304		309		306		294		304	5.8	294	311		
	1	319		352		363		350		388		390		379		363	25.3	319	390		
	2	340		406		419		405		473		478		471		427	50.3	340	478		
	3	385		516		550		535		644		665		657		565	100.5	385	665		
	4	427		617		675		640		843		859		854		702	160.8	427	859		
	5	472		742		819		755		997		1044		1052		840	209.7	472	1052		
Replicate measured		C	D	B	A	D	B	C	A	B	A	A	D	C	D						
Initials		GB	RCD	AG	RCD	RCD	RCD	LT	AG	AG	GB	AG	GB	GB	RCD						
Changes & Notes (Initials, date, specific change or notes)																					
Test Aerated?		No				D.O. Highest conc. @ aeration:				TRT ID:		1	2	3	4	5					
GWTT1601CPP		Date & Time Air Start:				Total live highest conc. @ aeration				CONC(%)		11.0%	23.0%	48.0%	74.0%	100%					

Fathead minnow daily biological measurements bench sheet (EPA METHOD 1000.0) Template version CPP5TRT061013

TRTMNT	Rep	#Live Day 0	#Live Day 1	#Live Day 2	#Live Day 3	#Live Day 4	#Live Day 5	#Live Day 6	#Live Day 7	Total Dry Wt (mg)	Tare Wt (mg)	Wt Count	Pan Number	
C	A	10	10	10	10	10	10	10	10	21.40	14.84	10	25	
	B	10	10	10	10	10	10	10	10	19.42	14.04	10	26	
Lab	C	10	10	10	10	10	10	10	10	22.90	17.17	10	27	
Control	D	10	10	10	10	10	10	10	10	22.20	15.96	10	28	
#1	A	10	10	10	10	10	10	10	10	22.94	16.35	10	29	
11.0%	B	10	10	10	10	10	10	10	10	19.70	12.23	10	30	
Vol. Effl:	C	10	10	10	10	10	10	10	10	21.46	15.79	10	31	
110 ml	D	10	10	10	10	10	10	10	10	17.84	12.09	10	32	
# 2	A	10	10	10	10	10	10	10	10	23.05	16.41	10	33	
23.0%	B	10	10	10	10	10	10	10	10	22.60	16.24	10	34	
Vol. Effl:	C	10	10	10	10	10	10	10	10	23.37	17.31	10	35	
230 ml	D	10	10	10	10	10	10	10	10	21.98	15.11	10	36	
# 3	A	10	10	10	10	10	10	10	10	20.38	14.18	10	37	
48.0%	B	10	10	10	10	10	10	10	10	21.20	15.76	10	38	
Vol. Effl:	C	10	10	10	10	10	10	10	10	20.51	14.33	10	39	
480 ml	D	10	10	10	10	9	9	9	9	21.43	15.77	10	40	
# 4	A	10	10	10	9	9	9	9	9	18.36	14.03	10	41	
74.0%	B	10	10	10	10	10	10	10	10	20.44	15.08	10	42	
Vol. Effl:	C	10	10	10	10	10	10	10	10	18.88	14.15	10	43	
740 ml	D	10	10	10	10	10	10	10	10	20.14	15.40	10	44	
# 5	A	10	10	10	9	9	9	8	8	15.75	13.06	10	45	
100%	B	10	10	10	10	10	10	10	10	21.25	17.20	10	46	
Vol. Effl:	C	10	10	10	10	10	10	10	9	16.21	12.94	10	47	
1000 ml	D	10	10	10	10	10	8	8	8	18.22	14.92	10	48	
INITIALS:		GB	AG	RCD	LT	AG	AG	GB	RCD	PB	GB	See ToxCalc printout for summary survival & biomass data		
DATE & TIME:		10/26/16 14:57	10/27/16 14:35	10/28/16 14:21	10/29/16 15:24	10/30/16 15:03	10/31/16 14:20	11/1/16 15:58	11/2/16 14:34	11/3/16 13:41	10/29/16 11:55			
SAMPLE USED:		A	B	B	B	C	C	C	50 mg wt ck:	50.00	50.00	Test Duration:	6d 23h 37m	
CHANGES & NOTES (INITIALS, DATE, SPECIFIC CHANGE MADE)														
	MEAN % CONTROL SURVIVAL (TAC 80% MIN):					100	AVG. DRY WT. PER SURV. CONTROL (TAC 0.25 mg):					0.598		
		COLLECTION									TIME 1st TO LAST USE			
		SAMPLE	DATE/TIME	1st USE DATE & TIME	LAST USE DATE & TIME		TIME COLLECT-1ST USE (TAC MAX 36h)			TIME COLLECT-1ST USE (TAC MAX 72 h)				
		A	10/25/16 18:00	10/26/16 14:57	10/26/16 14:57		20h 58m			0h 0m				
		B	10/26/16 18:00	10/27/16 14:35	10/28/16 14:21		20h 35m			23h 47m				
		C	10/29/16 15:00	10/30/16 15:03	11/1/16 15:58		24h 3m			48h 55m				
							0			0				
							0			0				
GWTT1601CPP														

Larval Fish Growth and Survival Test-7 Day Survival

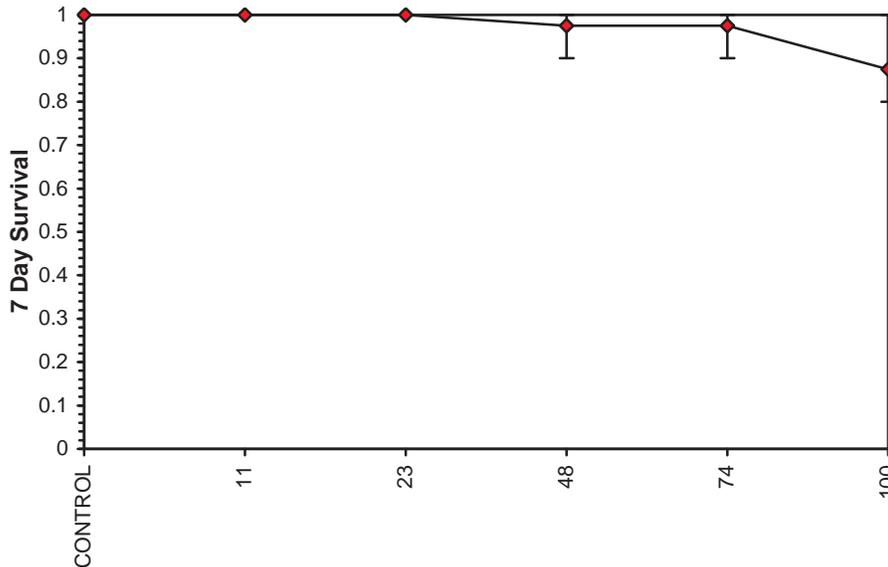
Start Date: Test ID: GWTT1601PP Sample ID:
 End Date: Lab ID: CBI Sample Type:
 Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: PP-Pimephales promelas
 Comments: DATA ENTERED BY PB

Conc-%	1	2	3	4
CONTROL	1.0000	1.0000	1.0000	1.0000
11	1.0000	1.0000	1.0000	1.0000
23	1.0000	1.0000	1.0000	1.0000
48	1.0000	1.0000	1.0000	0.9000
74	0.9000	1.0000	1.0000	1.0000
100	0.8000	1.0000	0.9000	0.8000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root				N	Rank Sum	1-Tailed Critical
			Mean	Min	Max	CV%			
CONTROL	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4		
11	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
23	1.0000	1.0000	1.4120	1.4120	1.4120	0.000	4	18.00	10.00
48	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00
74	0.9750	0.9750	1.3713	1.2490	1.4120	5.942	4	16.00	10.00
100	0.8750	0.8750	1.2188	1.1071	1.4120	11.906	4	12.00	10.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01) Equality of variance cannot be confirmed	0.79086	0.884	0.19041	2.66564
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1

Dose-Response Plot



Larval Fish Growth and Survival Test-7 Day Biomass

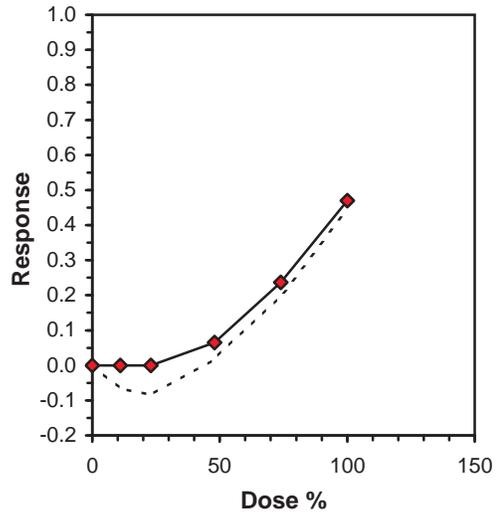
Start Date: Test ID: GWTT1601PP Sample ID:
 End Date: Lab ID: CBI Sample Type:
 Sample Date: Protocol: EPAF 94-EPA Freshwater Test Species: PP-Pimephales promelas
 Comments: DATA ENTERED BY PB

Conc-%	1	2	3	4
CONTROL	0.6560	0.5380	0.5730	0.6240
11	0.6590	0.7470	0.5670	0.5750
23	0.6640	0.6360	0.6060	0.6870
48	0.6200	0.5440	0.6180	0.5660
74	0.4330	0.5360	0.4730	0.4740
100	0.2690	0.4050	0.3270	0.3300

Conc-%	Mean	N-Mean	Transform: Untransformed					N	1-Tailed			Isotonic	
			Mean	Min	Max	CV%	t-Stat		Critical	MSD	Mean	N-Mean	
CONTROL	0.5978	1.0000	0.5978	0.5380	0.6560	8.781	4				0.6277	1.0000	
11	0.6370	1.0657	0.6370	0.5670	0.7470	13.237	4	-1.029	2.410	0.0919	0.6277	1.0000	
23	0.6483	1.0845	0.6483	0.6060	0.6870	5.406	4	-1.324	2.410	0.0919	0.6277	1.0000	
48	0.5870	0.9820	0.5870	0.5440	0.6200	6.480	4	0.282	2.410	0.0919	0.5870	0.9352	
*74	0.4790	0.8013	0.4790	0.4330	0.5360	8.879	4	3.114	2.410	0.0919	0.4790	0.7631	
*100	0.3328	0.5567	0.3328	0.2690	0.4050	16.755	4	6.948	2.410	0.0919	0.3328	0.5301	

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96395	0.884	0.39935	-0.3789						
Bartlett's Test indicates equal variances (p = 0.70)	3.00437	15.0863								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	48	74	59.5987	2.08333	0.09192	0.15377	0.05844	0.00291	8.6E-07	5, 18

Linear Interpolation (200 Resamples)					
Point	%	SD	95% CL(Exp)		Skew
IC05	42.293	7.377	21.244	60.577	-0.6075
IC10	53.320	4.853	34.053	65.237	-0.4850
IC15	60.876	4.638	45.995	78.606	0.2288
IC20	68.431	4.587	54.448	82.527	0.0002
IC25	75.467	3.861	62.582	85.281	-0.3006
IC40	92.204				
IC50	>100				



Effluent and Dilution Water Log (Freshwater Tests). FWEFFL061013

										SUMMARY WATER QUALITY DATA						
Initial sample characterization	Bottle(1):	A1	B1	C1							MEAN	S.D.	MIN.	MAX.	PARAMETER	
	Arrival Temp. (oC, from CoC):	1	1	6							3	2.9	1	6	Arrival Temp.	
	TRC (mg/l)(2):	<DL	<DL	<DL												
	TRC Corrected(2):															
	Hardness (mg/l):	40	216	254							170	114.2	40	254	Hardness (mg/l)	
	Alkalinity (mg/l):	50	30	37							39	10.1	30	50	Alkalinity (mg/l)	
	NH3-N (mg/l):	<1.0	<1.0	<1.0												
	Color/Appearance(3):	C	C	C												
	Obvious odor?	NO	NO	NO												
	Date & Time:	10/26/16 10:48	10/27/16 11:38	10/30/16 8:38												
Initials:	GB	AG	AG													
Sample prep measurements	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	ACUTE	MEAN	S.D.	MIN.	MAX.		
	Bottle(s):	A1	B1	B1	B1	C1	C1	C1							B1	
	Prep. Temp. (oC):	25	25	25	25	26	26	25			25	0.5	25	26	Temp. (oC)	
	D.O. (mg/l) After Warming:	8.8	8.5	9.3	9.1	8.7	9.1	9.1			8.9					
	Aeration Time (min):	1	1	2	2	1	2	2			2					
	Adjusted D.O. (mg/l):	8.2	8.2	8.2	8.2	8.1	8.1	8.2			8.1	8.2	0.0	8.1	8.2	D.O. (mg/l)
	Final pH (S.U.):	8.02	7.59	7.64	7.55	7.78	7.72	7.69			7.55	7.71	0.16	7.55	8.02	pH (S.U.)
	Conductivity (uS/cm)(4):	473	805	NA	NA	1033	NA	NA			824	770	281.6	473	1033	Cond. (uS/cm)
	Final TRC (mg/l)(5):	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.			N.D.					
	Sample Filtered (60 um)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>							
	Date & Time:	10/26/16 14:26	10/27/16 13:30	10/28/16 13:01	10/29/16 14:51	10/30/16 14:40	10/31/16 12:44	11/1/16 15:42			10/27/16 14:53					
	Initials:	PB	AG	RCD	GB	AG	AG	GB			AG					
Dilution water	Test Day:	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	ACUTE	MEAN	S.D.	MIN.	MAX.		
	Vat Number:	3	3	1	3	3	1	2			1					
	Temperature (oC):	25	25	25	25	25	25	25			25	25	0.0	25	25	Temp. (oC)
	Conductivity (uS/cm):	304	303	303	303	306	294	302			298	302	3.8	294	306	Cond. (uS/cm)
	D.O. (mg/l):	8.2	8.2	8.2	8.2	8.2	8.2	8.2			8.2	8.2	0.0	8.2	8.2	D.O. (mg/l)
	pH (S.U.):	7.89	7.79	7.81	7.81	7.85	7.87	7.79			7.85	7.83	0.04	7.79	7.89	pH (S.U.)
	Hardness (mg/l):	84	84	98	90	90	96	92			98	91	5.4	84	98	Hardness (mg/l)
	Alkalinity (mg/l):	59	59	58	57	57	57	57			58	58	1.0	57	59	Alkalinity (mg/l)
	Date & Time:	10/26/16 8:50	10/27/16 8:40	10/28/16 8:35	10/29/16 8:00	10/30/16 9:00	10/31/16 8:45	11/1/16 8:25			10/27/16 8:40					
	Initials:	RCD	RCD	RCD	RCD	AG	GB	GB			RCD					
Changes & Notes (Initials, date, specific change or notes)																
Peer review Initial/Date:	GB, PB	11/4/16 18:35	DILUTION WATER TYPE:	Mod. Hard Synthetic Freshwater (EPA)	ND=Not Determined/Measured, NA=Not Applicable. 1) Ninth character of lab sample ID on chain of custody AND bottle number in collection series. Together with Project ID constitutes entire sample bottle ID. 2) TRC MDL 0.02 mg/l, QL 0.22 mg/l. Corrected value if Min, Cr potential positive interference. Corrected using KI and NaAsO2. 3) C-clear, O-opaque, T-turbid, S-solids (S-slight, M-moderate, H-heavy), Y-yellow, B-brown, Bl-black, G-green, P-pink, Gr-grey, Or-orange. 4) Measured on first use of sample only. 5) Final TRC measured only if chlorine present in initial characterization.											
PROJECT ID:	GWTT1601	ADDITIONAL EFFLUENT TREATMENT:														



6400 Enterprise Court, Gloucester, VA 23061
 PH: 804-694-8285, FAX: 804-695-1129
 www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID
(Lab Use Only)

G	W	T	T	I	L	O	I	-	A
A	A	A	A	Y	Y	N	N		A

Project ID Spl

CBI
Login # 16-1988

FACILITY INFORMATION

CLIENT/FACILITY NAME <u>GWTT / DOMINION CHESTERFIELD</u>		CONTACT & PHONE # <u>Rob Orlando / 773-800-3531</u>	
NPDES PERMIT NO <u>N/A - pilot test no outfall permit required</u>		OUTFALL # OR LOCATION	
SAMPLE CHLORINATED? <u>Yes</u>	SAMPLE DECHLORINATED? <u>Yes</u>	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES? <u>No</u>	
TESTS REQUESTED:	SPECIES OR EPA METH # <u>C. dubia</u>	ACUTE <input type="checkbox"/>	CHRONIC <input checked="" type="checkbox"/>
	SPECIES OR EPA METH # <u>P. promelas</u>	ACUTE <input type="checkbox"/>	CHRONIC <input checked="" type="checkbox"/>
OTHER TESTS:			

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

① DATE & time per Rob Orlando 10/25/16

SAMPLE DATE <u>10/25/16</u>	SAMPLE TIME <u>1800</u>	SAMPLE VOLUME
-----------------------------	-------------------------	---------------

COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME		SAMPLE END DATE & TIME		AUTOSAMPLER TEMP. (°C)
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES	VOL (ml) SUBSAMPLES	TIME INCREMENT	
	SET VOLUME SUBSAMPLE	SET VOLUME FLOW	TOTAL VOLUME	

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

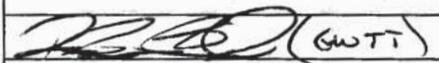
FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Rob Orlando / GWTT (PRINTED NAME/AFFILIATION SAMPLER/ANALYST)  (SIGNATURE) 10/25/16 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
 (GWTT)	<u>10/25/16</u>	<u>1800</u>	
	<u>10/26/16</u>	<u>1040</u>	<u>J. B.</u>

SHIPPING METHOD: UPS _____ FEDEX HAND DELIVERY _____ DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE OTHER _____

SAMPLE TEMP: (°C) _____ ARRIVED ON ICE? Y N _____ CUSTODY SEAL: INTACT _____ BROKEN _____ ABSENT

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.



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SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID
 (Lab Use Only)

G	W	T	T	I	L	O	I	-	B
A	A	A	A	Y	Y	N	N		A

Project ID Spl

CBI
 Login # 16-2002

FACILITY INFORMATION

CLIENT/FACILITY NAME <u>GWTT Dominion Chester</u> ^{FIELD}		CONTACT & PHONE # <u>Rob Orlando / 973 800-3531</u>	
NPDES PERMIT NO		OUTFALL # OR LOCATION	
SAMPLE CHLORINATED? <u>Yes</u>	SAMPLE DECHLORINATED? <u>Yes</u>	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES? <u>NO</u>	
TESTS REQUESTED:	SPECIES OR EPA METH # <u>C. dubia</u>	ACUTE <input checked="" type="checkbox"/>	CHRONIC <input checked="" type="checkbox"/>
OTHER TESTS:	SPECIES OR EPA METH # <u>P. promelas</u>	ACUTE <input checked="" type="checkbox"/>	CHRONIC <input checked="" type="checkbox"/>

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE <u>10/26/16</u>	SAMPLE TIME <u>1800</u>	SAMPLE VOLUME <u>2.5 gal</u>
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COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	SAMPLE END DATE & TIME	AUTOSAMPLER TEMP. (°C)	
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES	VOL (ml) SUBSAMPLES	TIME INCREMENT
	SET VOLUME SUBSAMPLE	SET VOLUME FLOW	TOTAL VOLUME

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Rob Orlando / GWTT (PRINTED NAME/AFFILIATION SAMPLER/ANALYST) [Signature] (SIGNATURE) 10/26/16 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
<u>Rob Orlando (GWTT)</u>	<u>10/26/16</u>	<u>1800</u>	
	<u>10/27/16</u>	<u>1130</u>	<u>[Signature]</u>

SHIPPING METHOD: UPS _____ FEDEX HAND DELIVERY _____

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE OTHER _____

SAMPLE TEMP: (°C) 1 ARRIVED ON ICE? Y N _____ CUSTODY SEAL: INTACT BROKEN _____ ABSENT _____

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.



6400 Enterprise Court, Gloucester, VA 23061
 PH: 804-694-8285, FAX: 804-695-1129
 www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID
(Lab Use Only)

G	W	T	T	I	6	0	1	-	C
A	A	A	A	Y	Y	N	N		A

Project ID Spl

CBI
Login # 16-2014

FACILITY INFORMATION

CLIENT/FACILITY NAME	<u>Gwtt / Dominion chestfield</u>		CONTACT & PHONE #	<u>Rob Orlando 973-800-3531</u>
NPDES PERMIT NO	<u>N/A pilot test on outfall/permit required</u>		OUTFALL #	
SAMPLE CHLORINATED?	<u>Yes</u>	SAMPLE DECHLORINATED?	<u>Yes</u>	IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES? <u>No</u>
TESTS REQUESTED:	SPECIES OR EPA METH #	<u>C. dubia</u>	ACUTE	<input type="checkbox"/>
			CHRONIC	<input checked="" type="checkbox"/>
	SPECIES OR EPA METH #	<u>P. promelas</u>	ACUTE	<input type="checkbox"/>
			CHRONIC	<input checked="" type="checkbox"/>
OTHER TESTS:				

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE	<u>10-29-16</u>	SAMPLE TIME	<u>1500</u>	SAMPLE VOLUME	<u>5gal</u>
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COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	SAMPLE END DATE & TIME	AUTOSAMPLER TEMP. (°C)
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES	VOL (ml) SUBSAMPLES
	SET VOLUME SUBSAMPLE	SET VOLUME FLOW
		TOTAL VOLUME

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

Brian Kisel (PRINTED NAME/AFFILIATION SAMPLER/ANALYST) [Signature] (SIGNATURE) 10-30-16 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
<u>[Signature]</u>	<u>10-30-16</u>	<u>900 AM</u>	<u>[Signature]</u>

SHIPPING METHOD: UPS ___ FEDEX ___ HAND DELIVERY

DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.

CONDITION ON ARRIVAL: ACCEPTABLE OTHER ___

SAMPLE TEMP: (°C) 6 ARRIVED ON ICE? Y N ___ CUSTODY SEAL: INTACT ___ BROKEN ___ ABSENT

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.



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 www.coastalbio.com

SAMPLE INFORMATION/CHAIN-OF-CUSTODY (FORM ETF2011I Rev. 8/7/13)

Lab Sample ID
 (Lab Use Only)

G	W	T	T	I	L	A	I
A	A	A	A	Y	N	N	

Project ID

D
A

Spl

CBI
 Login # 16-2032

FACILITY INFORMATION

CLIENT/FACILITY NAME <u>GWTT / DENNISON CHESTERFIELD</u>	CONTACT & PHONE # <u>ROS ORLANDO 973 800 3531</u>
NPDES PERMIT NO <u>N/A - Pilot Test / No Outfall or Permit</u>	OUTFALL # OR LOCATION
SAMPLE CHLORINATED? <u>Yes</u>	SAMPLE DECHLORINATED? <u>Yes</u>
IF CHLORINE PRESENT UPON ARRIVAL AT LAB, DOES PERMIT SPECIFY DECHLORINATION OF SAMPLES? <u>No</u>	
TESTS REQUESTED: SPECIES OR EPA METH # <u>C. dubia</u>	ACUTE <input type="checkbox"/> CHRONIC <input checked="" type="checkbox"/>
OTHER TESTS: SPECIES OR EPA METH # <u>P. promelas</u>	ACUTE <input type="checkbox"/> CHRONIC <input checked="" type="checkbox"/>

A SPECIFIC DILUTION SERIES MAY BE REQUIRED IN THE PERMIT. A DEFAULT SERIES OF 100, 50, 25, 12.5 AND 6.3%, OR CONCENTRATIONS USED IN PRIOR TESTING, WILL BE USED UNLESS INDICATED OTHERWISE. **IF IN DOUBT PLEASE ATTACH A COPY OF APPLICABLE PERMIT PAGES.**

GRAB SAMPLE INFORMATION

SAMPLE DATE <u>10/28/16</u>	SAMPLE TIME <u>1800</u>	SAMPLE VOLUME <u>4 gal</u>
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COMPOSITE SAMPLE INFORMATION

SAMPLE START DATE & TIME	SAMPLE END DATE & TIME	AUTOSAMPLER TEMP. (°C)
TIME OR FLOW PROPORTIONAL COMPOSITE INFORMATION	NUMBER SUBSAMPLES VOL (ml) SUBSAMPLES	TIME INCREMENT
	SET VOLUME SUBSAMPLE SET VOLUME FLOW	TOTAL VOLUME

FOR VARIABLE VOLUME SUBSAMPLES BASED ON FLOW (COMPOSITING "BY HAND") ATTACH SAMPLE AND FLOW INFORMATION ON SEPARATE SHEET

FIELD MEASUREMENTS

DISCHARGE TEMP (°C)	DISCHARGE pH (S.U.)	SAMPLE TEMP (°C)	SAMPLE pH (S.U.)	SAMPLE TRC (mg/l)	DATE/TIME (e.g. 02/23/00 1835)	INITIALS

MEASUREMENTS MUST BE TAKEN WITHIN 15 MINUTES OF SAMPLE OR LAST SUBSAMPLE COLLECTION.

COMMENTS:

ROS ORLANDO / GWTT (PRINTED NAME/AFFILIATION SAMPLER/ANALYST) [Signature] (SIGNATURE) 10/28/16 (DATE)

RELINQUISHED BY	DATE	TIME	RECEIVED BY
<u>[Signature]</u>	<u>10/28/16</u>	<u>1800</u>	
	<u>11/1/16</u>	<u>1430</u>	

SHIPPING METHOD: UPS _____ FEDEX HAND DELIVERY _____ **DO NOT SHIP FEDEX STANDARD OVERNIGHT. SAMPLES MUST ARRIVE AT LAB BY NOON.**

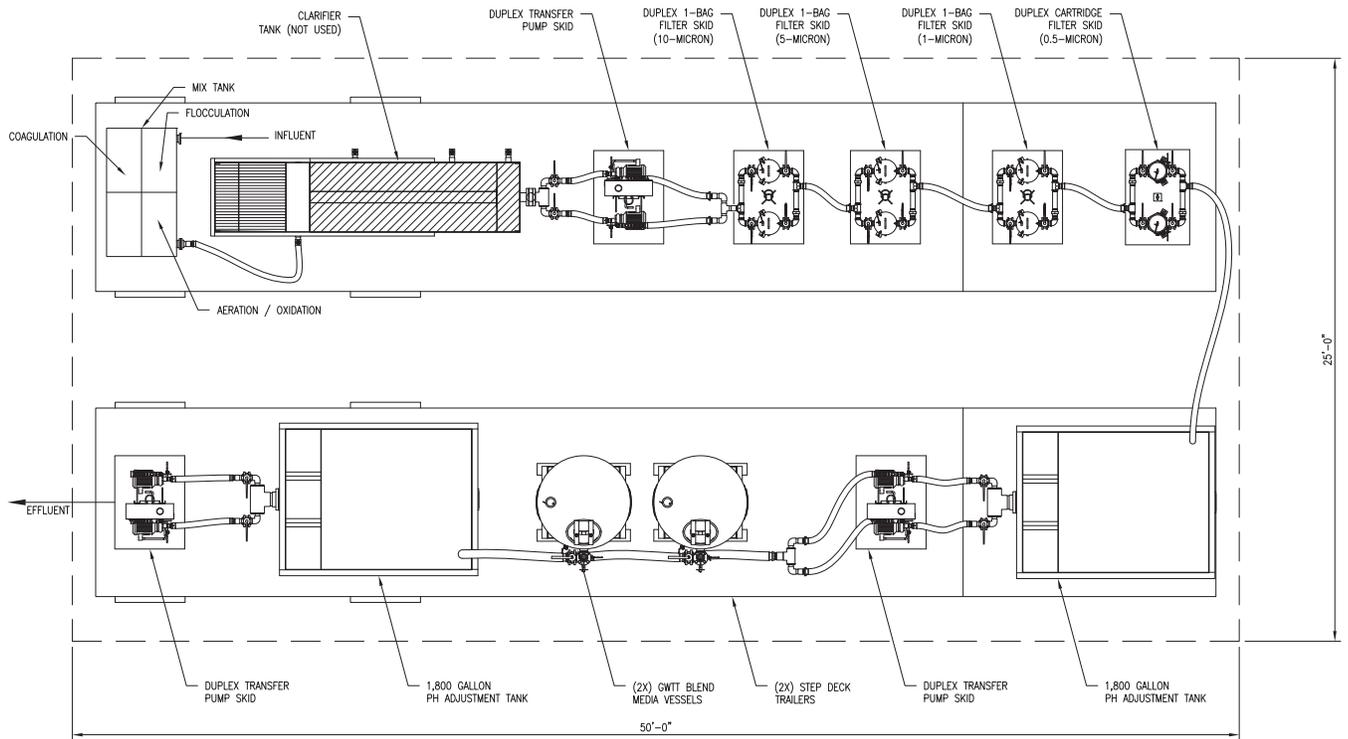
CONDITION ON ARRIVAL: ACCEPTABLE _____ OTHER expired prior to arrival

SAMPLE TEMP: (°C) _____ ARRIVED ON ICE? Y _____ N _____ CUSTODY SEAL: INTACT BROKEN _____ ABSENT _____

NOTE: It is the responsibility of the sampler to insure that samples are properly collected, preserved (>0-6° C) and shipped. Sample hold time is 36 h. Additional costs may be incurred by improper preservation, shipping or receipt of samples after 3 p.m. or on weekends and holidays.

Appendix C – Pilot Test Layout

TEMPORARY TREATMENT SYSTEM
OVERALL PLAN VIEW



NOTES:

1. DESIGN FLOW RATE: 25 GPM
2. SYSTEM FOOTPRINT APPROXIMATELY 25'x50'
3. NOT ALL VALVES, CONNECTIOS, ETC. SHOWN FOR CLARITY
4. GENERATOR BY OTHERS

D:\Cad Files\PROJECTS\04-14 - NJ Rentals\14-3100\14-3136 Dominion\Working CAD\JB-143136-LYT01(0).dwg - Tue, 8 Nov 2016 - 15:01				THIS DRAWING IS THE PROPERTY OF GROUNDWATER TREATMENT AND TECHNOLOGY, LLC. IT IS NOT TO BE USED FOR ANY PURPOSES SEPARATE TO THE INTEREST OF THIS COMPANY AND IS SUBJECT TO RETURN UPON REQUEST. SCALE: NTS						627 MOUNT HOPE ROAD - WHARTON, NJ 07885 PHONE: 973-983-0901 - FAX: 973-983-0903 www.gwtrllc.com	
CUSTOMER:		TITLE:		DRAWN:		BY: RS		DATE: 09/16/14			
DOMINION		EQUIPMENT LAYOUT		BT: RS		APPROVED:					
SITE:		25 GPM		BY: RS		DATE: 09/16/14					
CHESTERFIELD		TEMPORARY TREATMENT SYSTEM						DWG SIZE: B SHEET: 1 OF 1 DRAWING NO.: JB-143136-LYT01 B			
REV.	DATE	BY	REMARKS	REV.	DATE	BY	REMARKS				
A	09/16/16	RS	PRELIMINARY DESIGN FOR REVIEW								
B	11/08/16	RS/JF	AS-BUILT								