



CCR COMPLIANCE
ASSESSMENT OF CORRECTIVE MEASURES
SOUTH SETTLING POND
HUNTLEY GENERATING STATION

Prepared for:

Huntley Power LLC
Huntley Generating Station
Tonawanda, New York

Prepared by:

Aptim Environmental & Infrastructure, LLC
St. Charles, Illinois

August 2019

Table of Contents

List of Tables	iv
List of Figures	iv
List of Appendices	iv
List of Acronyms & Abbreviations	v
1.0 Introduction	1
2.0 Facility Overview	3
2.1 Location and Setting	3
2.2 Generating Station Operating History	4
2.3 Description of CCR Unit	4
2.4 South Parcel Known Environmental Conditions	5
2.4.1 Environmental Sampling	5
2.4.2 South Parcel Enrollment in the Brownfield Cleanup Program	5
3.0 CCR Groundwater Sampling	7
3.1 Sampling Network	7
3.2 Detection/Assessment Monitoring	7
3.3 Determination of Statistically Significant Levels above Groundwater Protection Standards	8
4.0 Initial Actions Undertaken Following Determination of SSL	9
4.1 Notification to State	9
4.2 Site Visit	9
4.3 Development of Field Investigation Plan	9
4.4 Timeline Extension	10
5.0 Subsurface Evaluation	11
5.1 Historic Data Review	11
5.1.1 Historic Uncontrolled Fill	11
5.1.2 Erie Canal	11
5.1.3 Coal Pile Slurry Wall	11
5.1.4 Soil Berm	11
5.2 Review of Previous Subsurface Field Investigation	12
5.3 2019 Subsurface Field Investigation	12
5.3.1 Arsenic Testing in Soil	13
5.3.2 Groundwater Flow Direction	14
5.3.3 Arsenic Testing in Groundwater and Surface Water	14
5.3.4 Piper Diagram Analysis	18
5.3.5 Summary	18

6.0	Characterization of Nature and Extent of Release	20
6.1	Overview	20
6.2	Potential Risks to Human Health & Environment.....	20
6.2.1	Exposure Pathways.....	21
6.2.2	Comparison to Health Standards	21
7.0	Corrective Measures Assessment	25
7.1	Overview	25
7.2	Source Control Corrective Measures.....	26
7.2.1	Closure in Place	26
7.2.2	Closure by Removal	28
7.3	Off-Site Migration Prevention	29
7.3.1	Monitored Natural Attenuation.....	29
7.3.2	Groundwater Extraction and Treatment.....	31
7.3.3	Impermeable Barrier (Slurry Wall or Sheet Pile Wall) Coupled with Upgradient Water Capture and Treatment	33
7.3.4	Permeable Reactive Barrier	34
7.3.5	In Situ Injection of a Reactive Compound.....	36
7.3.6	Phytotechnologies	37
8.0	Path Forward	40
8.1	Selection of Remedy	40
8.1.1	Coordination with Brownfield Program Findings and State of New York Guidance..	40
8.1.2	Public Meeting Prior to Remedy Selection	40
8.1.3	CCR Progress Reporting.....	41
8.2	Implementation of Remedy.....	41
8.2.1	Timeline.....	41
8.2.2	Determination of Success.....	42
9.0	Qualified Professional Engineer Certification.....	43
10.0	References	44

Figures

Appendices

List of Tables

Table 3.1-1	South Settling Pond—CCR Groundwater Monitoring Network Details
Table 3.2-1	CCR Assessment Monitoring Results—October 2018 Sampling Event
Table 5.3-1	Boring/Monitoring Well Summary—June 2019 Investigation
Table 5.3.1-1	Summary of Arsenic Testing of Soils—June 2019 Investigation
Table 5.3.3-1	Groundwater and Surface Water Sampling Parameters—June 2019 Investigation
Table 5.3.3-2	Summary of Groundwater Analytical Results—June 2019 Investigation
Table 5.3.3-3	Summary of Surface Water Analytical Results—June 2019 Investigation
Table 6.2.2-1	Summary of Arsenic Results in Groundwater—June 2019 Investigation
Table 6.2.2-2	Summary of Arsenic Results in Fill / Fly Ash—June 2019 Investigation
Table 6.2.2-3	Summary of Arsenic Results in Surface Water—June 2019 Investigation

List of Figures

Figure 1	South Parcel Site Features
Figure 2	Soil Borings and Monitoring Wells
Figure 3	Groundwater Potentiometric Map: June 21, 2019
Figure 4	Piper Diagram, Second Quarter 2019 Groundwater Samples

List of Appendices

Appendix A	Boring Logs and Well Construction Details
	A.1 CCR Monitoring Network for South Settling Pond
	A.2 2019 Field Investigation
Appendix B	State Notification
Appendix C	ACM Extension
Appendix D	Laboratory Report for Arsenic in Soils
Appendix E	Laboratory Report for June 2019 Groundwater Sampling

List of Acronyms & Abbreviations

ACM	Assessment of Corrective Measures
APTIM	Aptim Environmental & Infrastructure, LLC
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	below ground surface
CCR	coal combustion residuals
CCR Rule or Rule	Disposal of Coal Combustion Residuals from Electric Utilities Final Rule
CFR	Code of Federal Regulations
COPC	constituent of potential concern
GZA	GZA GeoEnvironmental of New York
Huntley	Huntley Power LLC
mg/L	milligram per liter
MNA	Monitored Natural Attenuation
msl	mean sea level
MW	megawatt
NRG	NRG Energy, Inc.
NYSDEC	New York State Department of Environmental Conservation
Pond	South Settling Pond
PPE	personal protective equipment
PRB	Permeable Reactive Barrier
PVC	polyvinyl chloride
SPDES	State Pollutant Discharge Elimination System
SPLP	synthetic precipitation leaching procedure
SSL	statistically significant level
Station	Huntley Generating Station

1.0 Introduction

Title 40 Code of Federal Regulations (CFR) mandates that existing Coal Combustion Residuals (CCR) landfills and surface impoundments, also known as CCR units, be subject to groundwater monitoring and corrective action requirements as further detailed in §257.91 through §257.98. These requirements are part of the overall CCR Rule (or Rule) which was published in the Federal Register on April 17, 2015, and became effective on October 19, 2015. The Huntley Generating Station's (Station) South Settling Pond (Pond), owned and maintained by Huntley Power LLC (Huntley), a subsidiary of NRG Energy, Inc. (NRG), is subject to the aforementioned groundwater monitoring and corrective action requirements. The Station ceased electric generating operations in February 2016, subsequent to the effective date of the Rule.

Specific obligations for groundwater Detection Monitoring and Assessment Monitoring are outlined in §257.94 and §257.95, respectively. The Pond was transitioned into the CCR Assessment Monitoring program in early 2018, and subsequent rounds of groundwater monitoring were conducted in May 2018 and October 2018. Ultimately, the results from the October 2018 sampling event indicated concentrations of arsenic in downgradient Well CCR-2 to be at a statistically significant level (SSL) above the corresponding Groundwater Protection Standard. Total arsenic is the only Appendix IV parameter that has been detected at a SSL.

This determination triggered additional obligations pursuant to §257.95(g)(1-3) including providing notification that a groundwater protection standard had been exceeded, and performing necessary activities to characterize the nature and extent of the arsenic impacts. In accordance with the Rule, the characterization activities must be sufficient to support a complete and accurate Assessment of Corrective Measures (ACM) to meet the requirements of §257.96, and further support the eventual selection of a remedy that meets the standards contained in §257.97(b)(1-5). Implementation of the selected remedy and determination of its successful completion must comply with the protocols specified in §257.98. Since the Pond is an unlined impoundment, the requirements of §257.101(a)(1) are also applicable, which mandate that placement of CCR and non-CCR materials and waste streams into the Pond must cease by October 31, 2020.

This report presents the results of the characterization activities with regard to field investigation of groundwater, surface water, and soils, and the ACM to satisfy the requirements of §257.96(a) and §257.96(c)(1-3). This report will be placed in the Huntley facility operating record per §257.105(h)(10), noticed to the State Director per §257.106(h)(8), and posted to the publicly accessible website per §257.107(h)(8). A copy of this report will also be appended to the annual Groundwater Monitoring and Corrective Action Report (forthcoming by January 31, 2020) for the Huntley Station.

Aptim Environmental & Infrastructure, LLC (APTIM) acknowledges that a portion of the Huntley Station referred to as the South Parcel (which encompasses the Pond) has been enrolled in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) in February 2019. As such, site characterization and potential remedy selection and implementation activities outside the governance of the CCR Rule will be performed on this portion of the Huntley facility. Data and findings from the BCP investigative activities, when available, will supplement the information presented herein and also need to be considered as part of the CCR remedy selection process for the Pond.

2.0 Facility Overview

2.1 Location and Setting

The Station is a former coal-fired power plant located in Tonawanda, New York, and is situated on a 93-acre tract located immediately north of Sheridan Drive, between River Road to the east and the Niagara River to the west. The 35-acre South Parcel (which includes the Pond), was historically used for coal staging, stormwater and process water management, and CCR management. At one time, the Erie Canal was located on the Station property adjacent to River Road. A right-of-way easement indicates that the historic Erie Canal traverses the site from north to south along the eastern site boundary. The former canal was completely backfilled with soil and fill materials to grade and is currently unrecognizable at the land surface.

Currently observable site features of the South Parcel include the following and are shown on Figure 1:

- Former Coal Pile (approximately 15 acres): The former electric power generation plant was fueled by coal which was stockpiled in the northwestern quadrant of the South Parcel. Following the cessation of electric generating operations, the coal has since been removed from the stockpile area. The perimeter of the former coal pile footprint is surrounded by a subsurface low-permeability slurry wall and drainage pumping system to prevent migration of leachate from the area within the slurry wall.
- South Settling Pond (approximately 3 acres): The Pond was constructed for control and capture/settling of CCR materials (principally ash) sluiced from the plant. The CCR materials were periodically dredged from the Pond and disposed of at Huntley's off-site ash landfill in Tonawanda, New York.
- Two Equalization Basins (approximately 3 acres): The two asphalt basins were constructed and used to manage stormwater and groundwater collected from the coal pile area. Water from the basins was conveyed to the on-site wastewater treatment plant prior to discharge to the Niagara River under a NYSDEC State Pollutant Discharge Elimination System (SPDES) permit.
- Soil Berm (approximately 1.7 acres): A berm is located along the eastern boundary of the site, oriented in the north-south direction. The berm was placed there to provide a visual barrier of the site from a nearby paved bike/walking trail that parallels River Road. The berm has two segments that are divided for site access in case of an emergency such as fire. The berm is grass covered and is approximately 8 feet high.

With NYSDEC's permission, the berm was constructed of soil with elevated levels of arsenic generated from excavation associated with a 2007 bag house construction at the Plant. The berm was covered with clean soil and seeded to form a complete grass cover per the Beneficial Use Determination issued by NYSDEC in 2007. The berm is located within the former Erie Canal right-of-way.

The remaining approximately 12 acres surrounding these features consists of site access roads and open vegetated covered space.

2.2 *Generating Station Operating History*

The Huntley Station was originally constructed in 1916 under the ownership of Buffalo General Electric Company. The Station was initially named River Station, but was renamed the Charles R. Huntley Station in 1926 upon the death of Buffalo General Electric Company's president. In 1929, the Huntley Station and all other generating stations serving Upstate New York joined together to form the Niagara Hudson Power Corporation. This corporation underwent internal reorganization in 1950 and became the Niagara Mohawk Power Company.

Upon opening in 1916, only the first 20 megawatt (MW) unit of several planned units was operational. However, additional units were added to the Station throughout its operational life. During World War II, the Station held the distinction of being the largest coal-fired generating facility in the world, and in 1958 the Station reached its maximum capacity of 1,150 MW. The capacity decreased in following years as several generating units were retired.

In the early 1980s, the Station was the host site for a prototype process to remove sulfur from the flue gas, with the end product being elemental sulfur. A wastewater treatment facility was constructed in 1984 that treated all coal pile runoff as well as boiler side washes before permitted discharge to the Niagara River. NRG acquired the facility in 1999 and in August 2015 submitted a plan to the New York Public Service Commission to retire the facility. The Station ceased operations on March 1, 2016.

2.3 *Description of CCR Unit*

The South Settling Pond was constructed to accept process water from the power plant that included CCR sluice water (associated with the bottom ash removal system) and other non-CCR water (derived from sumps, non-contact cooling water, stormwater, and other various sources). Based on a review of historical aerials and available facility design documents, the current configuration of the Pond dates back to approximately 1978. As of February 29, 2016, all CCR sluice water discharge into the Pond was ceased as the power plant boilers were taken out of service. The Pond currently manages non-CCR streams including stormwater runoff and flows from various on-site sumps.

The Pond includes an embankment located between the south end of the Pond and the Niagara River. The embankment includes an asphalt-paved access road over its top portion and riprap armor side slopes between the asphalt and the shorelines on both sides of the embankment. A corrugated metal pipe is present within the embankment that allows SPDES-permitted discharge from the Pond (via Outfall 008) to the Niagara River. This corrugated metal pipe is oval shaped,

with a pond-side invert elevation at approximately 569 feet mean sea level (msl) and a river-side invert elevation at approximately 568.0 feet msl. Although inflow rates varied based on operations, the surface water elevation within the Pond generally remained constant due to the invert elevation of the outlet pipe.

Dredging was completed roughly every 5 years during plant operations, or as necessary. The last complete Pond dredging was completed in December 2008, whereupon approximately 20,000 cubic yards of material were removed and disposed at Huntley's CCR Landfill. In accordance with GZA GeoEnvironmental of New York's (GZA) Closure Design Report (GZA, 2016), it is estimated that the maximum CCR inventory remaining at the bottom of the surface impoundment is 23,000 cubic yards. This represents material deposited between the last maintenance dredging in 2011 and the cessation of power plant operations in 2016.

2.4 South Parcel Known Environmental Conditions

2.4.1 Environmental Sampling

Ongoing groundwater sampling is performed at the South Parcel based on two regulatory programs:

- Coal Pile Groundwater Monitoring: Monitoring is performed as part of the SPDES requirements. Eight groundwater monitoring wells surrounding the former coal pile are sampled for eight specific metals and total dissolved solids.
- South Settling Pond CCR Rule Monitoring: Groundwater is sampled at four groundwater monitoring wells and analyzed for the Appendix III and required Appendix IV constituents as a requirement of the CCR Rule (discussed in Section 3.0).

In addition to groundwater sampling, limited site investigations have been completed to identify general environmental conditions. These programs and investigations have confirmed the following environmental conditions:

- Elevated levels of arsenic in the subsurface soils/fill materials, berm soils, and groundwater.
- Petroleum impacts in select areas of the former coal pile.
- Elevated levels of antimony, arsenic, boron, iron, lead, and manganese in wells sampled as part of the Coal Pile Monitoring Program.

2.4.2 South Parcel Enrollment in the Brownfield Cleanup Program

As previously mentioned, the Station's South Parcel was enrolled into the New York State BCP on February 22, 2019 by signing a Brownfield Cleanup Agreement (BCA) with the NYSDEC. The purpose of the BCA is to proactively identify the nature and extent of potential environmental

impacts (including those related to legacy operations) so that site remediation methods can be appropriately selected to restore the South Parcel to a condition suitable for redevelopment. A Remedial Investigation Work Plan, which outlines the proposed activities to characterize and investigate the South Parcel was prepared and submitted to the NYSDEC in March 2019.

While the BCA is intended to address the entire South Parcel, this CCR ACM report focuses only on total arsenic impacts in groundwater associated with the Pond, pursuant to CCR Rule requirements. The investigation to support the BCA will not be complete by the time of the regulatory deadline for this ACM (August 30, 2019), as the Remedial Investigation Work Plan is still pending approval. However, the results of the BCA investigation will be considered when selecting a remedy to prevent the off-site release of arsenic to ensure a cohesive environmental management strategy that may address other potential environmental conditions. It is highly anticipated that findings from the BCA field investigation will supplement and/or augment the findings of the CCR ACM investigation, and impact the ultimate selection of the remediation method for the Pond and its surroundings.

3.0 CCR Groundwater Sampling

3.1 Sampling Network

The originally established CCR groundwater monitoring network for the Pond is comprised of four wells, including Well CCR-3 (upgradient) and Wells A-2, CCR-1, and CCR-2 (downgradient). These well locations are shown on Figure 2. Wells CCR-1, CCR-2, and CCR-3 were installed in September 2015 to directly support groundwater monitoring under the CCR Rule. Existing Well A-2 (installed in September 1983) was also selected to become part of the CCR groundwater monitoring network due to its downgradient position. The depth to groundwater in the uppermost aquifer is generally 10 to 15 feet below ground surface (bgs). The ground surface elevations in and around the area of the Pond range between approximately 575 and 580 feet msl. Installation details and boring logs for the wells are contained in Appendix A.1, with pertinent information summarized below.

Table 3.1-1: South Settling Pond—CCR Groundwater Monitoring Network Details						
Monitoring Well No.	Hydraulic Position	Casing Diameter (inches/material)	Ground Surface Elevation (feet msl)	Top of PVC Casing Elevation (feet msl)	Well Total Depth (feet bgs)	Top/Bottom Elevations of Screened Interval (feet msl)
CCR-3	Upgradient	2-inch polyvinyl chloride (PVC)	578.80	581.86	17.0	566.80 / 561.80
A-2	Downgradient	1.5-inch PVC	575.59	578.70	64.1	516.29 / 511.49
CCR-1	Downgradient	2-inch PVC	573.67	576.05	15.7	562.97 / 557.97
CCR-2	Downgradient	2-inch PVC	574.94	577.01	17.5	562.44 / 557.44

3.2 Detection/Assessment Monitoring

As part of the routine CCR groundwater monitoring program, sampling data from the first round of Detection Monitoring (conducted in October 2017) were reviewed, and a subsequent determination made in January 2018 that each of the downgradient wells showed one or more Appendix III constituents at levels representing a statistically significant increase above corresponding background concentrations.

Accordingly, the Pond was transitioned into the CCR Assessment Monitoring Program, and an initial round of samples covering all Appendix IV constituents was collected in March 2018 per §257.95(b). From these results, the detected Appendix IV constituents were carried forward and analyzed during continued Assessment Monitoring events conducted in May 2018 and October 2018. As shown in Table 3.2-1, data from the October 2018 monitoring event preliminarily

indicated arsenic at a concentration [0.023 milligram per liter (mg/L)] above the site-specific Groundwater Protection Standard in downgradient Well CCR-2. The Groundwater Protection Standard for total arsenic specific to the Pond is 0.016 mg/L, representing the statistically calculated background value in upgradient Well CCR-3.

Table 3.2-1: CCR Assessment Monitoring Results October 2018 Sampling Event				
Parameter	Concentration (mg/L) unless noted			
	A-2	CCR-1	CCR-2	CCR-3
Appendix III				
pH (SU)	7.43	7.73	8.45	6.17
Boron	0.53	0.25	5.32	1.22
Calcium	420	38	94	354
Chloride	88	212	35	243
Fluoride	0.38	0.26	0.45	< 0.20
Total Dissolved Solids	2400	520	585	2560
Sulfate	1150	54	116	791
Appendix IV				
Arsenic	< 0.005	< 0.005	0.023	< 0.005
Barium	0.03	0.10	0.05	0.06
Chromium	< 0.005	< 0.005	< 0.005	< 0.005
Fluoride	0.38	0.26	0.45	< 0.20
Radium 226 + 228, (pCi/L)	0.97	1.58	1.25	1.13

3.3 ***Determination of Statistically Significant Levels above Groundwater Protection Standards***

The results from the October 2018 Assessment Monitoring event were further reviewed, and in January 2019, a determination was made that the arsenic concentration in Well CCR-2 did represent a statistically significant level (SSL) above the corresponding site-specific Groundwater Protection Standard. Subsequent to this determination and in compliance with the CCR Rule, appropriate notification was made to the State Director that an SSL for arsenic was identified and that field investigation/characterization efforts would be initiated as required. Additional discussion of these activities is provided in Section 4.0.

4.0 Initial Actions Undertaken Following Determination of SSL

4.1 Notification to State

In January 2019 and pursuant to the CCR Rule, NRG notified the Division of Materials Management Director of the NYSDEC that the facility had identified an SSL above the corresponding groundwater protection standard per §257.106(h)(6). This notification was also placed into the facility operating record per §257.105(h)(8), and posted to the publicly accessible website per §257.107(h)(6). This notification also indicated that an ACM would be initiated (commencing on April 2, 2019), and thus satisfying the requirements of §257.106(h)(7), along with those associated with placement into the operating record [§257.105(h)(9)] and posting to the publicly accessible website [§257.107(h)(7)]. A copy of the State Notification is provided in Appendix B.

4.2 Site Visit

APTIM representatives visited the Huntley Station on March 7, 2019. The goal of the visit was to view site conditions and identify data gaps that should be addressed in a field investigation to support the ACM. APTIM met with representatives from the following parties:

- NRG
- Huntley Power LLC (site owner and operator)
- GZA (coordinating the BCA)
- Frontier Technical Associates (field investigation services contractor)

A meeting and site walk were conducted that focused on known environmental conditions of the overall South Parcel (including the Pond), site constraints, and historical investigations and records. The meeting concluded with parties in agreement on how to develop a comprehensive field investigation plan that would provide sufficient information that would meet both ACM and BCA objectives.

4.3 Development of Field Investigation Plan

Representatives at the site visit developed a field investigation plan that will meet the needs of the BCA and the CCR Rule ACM. In general, the CCR Rule ACM will focus on defining the nature and extent of the arsenic groundwater plume to assess corrective measures that may be employed to prevent impacts from migrating off site. The BCA investigation will be more comprehensive in order to identify and characterize potential legacy impacts for facilitating future redevelopment activities. Legacy impacts considered under the BCA will be comprehensive and will include

impacts related to CCR (such as the arsenic groundwater plume) and unrelated to CCR (such as petroleum impacts at the coal pile).

The field investigation plan included the following components related to the CCR ACM:

1. Advance seven borings across the site to a minimum depth of 15 feet to characterize the near-surface and subsurface conditions.
2. At each soil boring location, test the soil for the presence of arsenic. If arsenic is present, complete synthetic precipitation leaching procedure (SPLP) testing to assess to what extent arsenic would leach from soil/fill materials into groundwater.
3. Install new groundwater monitoring wells at all soil borings that encounter a water-bearing unit.
4. Sample each new well, along with the four existing wells (A-2, CCR-1, CCR-2, and CCR-3) for all currently specified parameters, including field parameters, Appendix III constituents, and detected Appendix IV constituents (including total arsenic).
5. Sample each new well, along with the four existing wells for dissolved arsenic (a useful parameter for risk assessment and fate and transport studies).
6. Sample each new well, along with the four existing wells, for a cation/anion list selected to create a “fingerprint” of the groundwater at each location. This fingerprint could be used to potentially assist in linking impacted areas.
7. Sample the surface water from both Equalization Basins and the South Settling Pond and analyze for the same parameters as specified above in Items 4, 5, and 6.

The location of the borings and wells, as well as testing methods and results, are presented in Section 5.0.

4.4 *Timeline Extension*

Pursuant to §257.96(a), the ACM must be initiated within 90 days from determining that a Groundwater Protection Standard has been exceeded, and then must be completed within 90 days from initiation unless additional time is needed. Because of the complexities related to characterizing the subsurface geology and groundwater quality associated with the arsenic SSL, APTIM’s professional engineer certified that a 60-day extension was appropriate for completing the ACM. Based on the certification prepared on April 2, 2019, the ACM’s required completion date was extended to August 30, 2019. A copy of the certification is provided in Appendix C.

5.0 Subsurface Evaluation

5.1 Historic Data Review

The Huntley Station was in operation for approximately 100 years. Modifications to the South Parcel landscape were made during its operation that obviously affected near-surface and subsurface conditions. Although known to have occurred, many of these modifications are not well documented. A brief overview of this aspect is provided in the sections below based on limited available historical records and discussions with NRG personnel.

5.1.1 Historic Uncontrolled Fill

Historic uncontrolled (also known as random) fill was placed to raise the elevation of the site above the Niagara River to prevent against flooding and to provide a stable working surface for operations. The fill was comprised of many material types throughout its placement, including CCR, slag, brick, wood, and soils, among others. The uncontrolled fill was placed on top of native soils, is approximately 15 feet thick, and assumedly varies in thickness, age, and composition across the site. The South Settling Pond is founded within this uncontrolled fill.

5.1.2 Erie Canal

At one time, the Erie Canal was located on the Station property adjacent to River Road. A right-of-way easement indicates that the historic Erie Canal traverses the site from north to south along the eastern site boundary. The former canal was completely backfilled with soil and fill materials to grade and is currently unrecognizable at the land surface. Based on a review of available historic photographs of the site, it is estimated that the canal was backfilled in the late 1930s or 1940s. It is possible that the fill within the former Erie Canal is different than the uncontrolled fill used elsewhere within the South Parcel.

5.1.3 Coal Pile Slurry Wall

In 1984, a hydraulic control system was installed around and within the coal pile. The system included a subsurface earthen slurry wall and dewatering pumping stations to manage impacted groundwater.

5.1.4 Soil Berm

A berm is located along the eastern boundary of the South Parcel, oriented in the north-south direction. The berm was constructed to provide a visual barrier of the site from a nearby paved bike/walking trail that parallels River Road. The berm is grass covered and is approximately 8 feet high, and is divided into two segments by an access road.

With NYSDEC's permission, the berm was constructed utilizing soil with elevated levels of arsenic that were generated from excavation activities associated with a 2007 bag house construction project at the power plant. The berm was covered with clean soil and seeded to form a complete grass cover pursuant to the Beneficial Use Determination issued by NYSDEC in 2007.

5.2 Review of Previous Subsurface Field Investigation

Previous investigations of the subsurface have been completed at the site, including the most recent in 2014/2015 performed by GZA and documented in the "Pond Embankment Evaluation" report (GZA, 2015). This investigation was completed prior to the promulgation of the CCR Rule, but is included as part of the initial hazard assessment documentation for the Pond (posted to the public website), prepared in support of the requirements in §257.73 of the Rule.

Based on several borings installed in the embankment near the discharge of the Pond, the overburden conditions in this area are summarized in GZA's report as follows:

- Overburden Fill: The fill thickness varied between 10 and 12 feet. The materials were visually described as varying between sand, gravel, and slag in the upper portions of the fill to silt and fine sand in the lower portions. Lesser amounts of brick, metal, and wood fragments were observed throughout the fill material. The fill samples were predominantly coarse-grained and non-plastic and generally observed with relative densities ranging from very loose to very dense.
- Silt and Fine Sand: The silt and fine sand soil was 10 to 12 feet in depth below the fill layer. The recovered samples were described as generally a grey to dark grey silt and fine sand soil with relative densities ranging from very loose to loose.
- Sand: A sand layer including very fine to coarse sand was observed at depths ranging from about 17.5 to 19 feet bgs and its presence continued to the end of each boring. These sands were observed with trace amounts of silt and rounded gravel with relative densities ranging from very loose to dense.

5.3 2019 Subsurface Field Investigation

During June 2019 and in direct support of the CCR ACM activities and in accordance with the field investigation work plan discussed in Section 4.3, seven new soil borings were advanced throughout the South Parcel (including locations both upgradient and downgradient of the Pond) to depths ranging between 16 and 20 feet. Borings were advanced using a rotary drill rig and were sampled with a 2-foot split-spoon. Hollow-stem augers with 4.25-inch inner diameters were used in conjunction with the split-spoon samplers to reduce cave-in of loose soil and fill during sampling and to facilitate construction of groundwater monitoring wells.

Five of the borings encountered water-bearing units and were converted into permanent groundwater monitoring wells, designated as Wells CCR-7, CCR-8, CCR-9, CCR-10, and

CCR-11. The remaining two borings (CCR-12 and CCR-13), both of which were advanced hydraulically upgradient of the Pond, exhibited confining units and did not produce water appropriate to support well development. The new monitoring wells are designed to intersect the groundwater table, and are constructed of 2-inch diameter, Schedule 40 PVC, with 5 feet of 0.010-slot PVC screen. The approximate locations of the borings and monitoring wells are shown on Figure 2. The boring logs and well construction details are provided in Appendix A.2.

Field logs indicate that the subsurface at six of the seven borings is predominantly fill. Location CCR-12 is the only boring that did not contain fill, and is situated on the upgradient (northeastern) side of the Pond. At each of the six boring locations with fill, portions of the fill were described to either be comprised of fly ash or contain ash or trace coal. This finding indicates that coal and/or CCR material is located outside of the boundary of the Pond and in areas spread across the South Parcel. A summary of the details and observations made during the advancement of the soil borings and installation of the new monitoring wells is provided below in Table 5.3-1.

Table 5.3-1: Boring/Monitoring Well Summary—June 2019 Investigation			
Boring/ Monitoring Well	Depth	Screened Interval	Fill Observations (See Boring Logs for Complete Description)
CCR-7	18	10-15'	Fly Ash Fill from 0-18' depth
CCR-8	16	10-15'	Sandy Silt Fill from 0-8'; Fly Ash Fill from 8-16' depth
CCR-9	16	10-15'	Fly Ash Fill with Sand from 0-14'; Poorly Graded Sand 14-16' depth
CCR-10	16	10-15'	Silty Sand Fill with Trace Coal 0-8' depth; Fly Ash Fill from 8-14' depth; Silty Sand 1-16' depth
CCR-11	16	10-15'	Silty Sand Fill with Trace Coal 0-12' depth; Silty Sand 12-16' depth
CCR-12	20	Not converted (no water-bearing unit)	Silty Clay 0-20' depth
CCR-13	20	Not converted (no water-bearing unit)	Silty Sand with Fly Ash Fill 0-8' depth; Silty Clay Fill 8-10' depth, Silty Clay 10-20' depth

5.3.1 Arsenic Testing in Soil

At least one soil sample was collected from the vadose zone for laboratory analysis from each soil boring location. A second soil sample was collected from borings CCR-8 and CCR-10 (at the 10 to 12 feet depth interval) due to their proximity to Well CCR-2 (which presently shows the arsenic SSL) and due to the depth of fly ash fill recorded (8 to 14 feet depth interval). Soil samples were submitted for total and SPLP arsenic testing. The SPLP test method passes a synthetic leaching agent (intended to mimic local rainwater) through the soil sample and analyzes the chemical

constituents in the resulting leachate. The SPLP protocols are specified in U.S. Environmental Protection Agency SW-846 Method 1312.

The results indicate that total arsenic is present within five of the seven boring locations, including CCR-8, CCR-9, CCR-10, CCR-11 and CCR-13. The SPLP results show measurable leached concentrations of arsenic only in boring location CCR-8. The SPLP-positive sample from CCR-8 was collected from a sandy silt fill layer that was observed to be present from 0 to 8 feet bgs. CCR-8 is located hydraulically downgradient from the Pond and upgradient of Well CCR-2. Refer to Table 5.3.1-1 for a summary of total and SPLP arsenic concentrations. The soils testing laboratory analytical report is included in Appendix D.

Table 5.3.1-1: Summary of Arsenic Testing of Soils—June 2019 Investigation			
Boring/Well Location	Sampling Interval Depth Below Grade (ft)	Total Arsenic Concentration (µg/g)	SPLP Arsenic (mg/L)
CCR-7	5 - 7	< 0.280	< 0.050
CCR-8	5 - 7	56.0	0.168
CCR-8	10 - 12	58.6	< 0.050
CCR-9	5 - 7	19.0	< 0.050
CCR-10	5 - 7	16.9	< 0.050
CCR-10	10 - 12	< 0.308	< 0.050
CCR-11	5 - 7	8.42	< 0.050
CCR-12	5 - 7	< 0.310	< 0.050
CCR-13	5 - 7	79.2	< 0.050

5.3.2 Groundwater Flow Direction

Groundwater elevations were recorded at all newly installed groundwater monitoring wells and existing CCR wells on June 21, 2019. This information was then used to develop a potentiometric map to depict the groundwater flow direction. As shown on Figure 3, groundwater generally flows from northeast to southwest toward the Niagara River.

5.3.3 Arsenic Testing in Groundwater and Surface Water

Each new and existing CCR monitoring well was sampled using low-flow purging and sampling techniques for the parameters listed in Table 5.3.3-1. Surface water grab samples were also collected from the Pond and Equalization Basins 1 and 2 and tested for the same parameters.

Table 5.3.3-1: Groundwater and Surface Water Sampling Parameters—June 2019 Investigation				
Field Parameters	CCR Appendix III Parameters	Selected CCR Appendix IV Parameters ¹	Cations/Anions for Piper Diagrams ²	Other
pH	Boron (Total)	Arsenic (Total)	Magnesium	Arsenic (Dissolved)
Temperature	Calcium (Total)	Barium (Total)	Sodium	
Turbidity	Chloride (Total)	Fluoride (included with App. III; Total)	Potassium	
Specific Conductance	Fluoride (Total)	Mercury (Total)	Alkalinity (bicarbonate)	
Dissolved Oxygen	pH (field parameter)	Radium 226 and 228 Combined (Total)	Sulfate	
Oxidation-Reduction Potential	Sulfate		Chloride	
	Total Dissolved Solids (TDS)		pH (field parameter)	

¹ Selected Appendix IV parameters represent chemical constituents detected from the January 2019 CCR groundwater monitoring event.

² The selected cations and anions will be used to develop piper diagrams. Piper diagrams evaluate the similarity of groundwater geochemistry at multiple observation points and identify likely sources of groundwater impacts when multiple sources are present. Piper diagrams plot the proportion of three dependent chemical constituents (cations and anions). Groundwater that flows through a medium leaching these constituents will generally exhibit clustered data points at downgradient observation points.

The groundwater sampling results provided below in Table 5.3.3-2 indicate that total arsenic was reported in Well CCR-2 at a similar concentration (0.024 mg/L) to historical results, which is again in excess of the established Groundwater Protection Standard (0.016 mg/L) for the Pond. Additionally, total arsenic exceeds the Groundwater Protection Standard in newly installed Wells CCR-7 (0.020 mg/L) and CCR-8 (0.055 mg/L). Both of these new monitoring wells are downgradient of the Pond. Well CCR-8 is upgradient of Well CCR-2. Dissolved arsenic was reported in Wells CCR-2, CCR-7, and CCR-8 at concentrations of 0.019 mg/L, 0.016 mg/L, and 0.050 mg/L, respectively.

Table 5.3.3-2: Summary of Groundwater Analytical Results—June 2019 Investigation

Parameter	Concentration (mg/L) unless noted									
	A-2	CCR-1	CCR-2	CCR-3	CCR-7	CCR-8	CCR-9	CCR-10	CCR-10 (Duplicate)	CCR-11
Casing Elevation (ft msl)	578.70	576.05	577.01	581.86	581.11	579.61	577.75	578.83	*	577.64
Depth to Water (feet)	13.38	8.56	10.05	12.73	10.12	11.04	9.75	10.12	*	11.04
Water Elevation (ft msl)	565.32	567.49	566.96	569.13	567.63	567.79	567.89	567.63	*	567.79
pH (SU)	6.21	8.58	8.07	7.40	8.09	6.81	8.58	8.09	*	6.81
Spec. Cond.(µmhos/cm)	2,530	1,013	807	3,190	1,314	863	750	1,073	*	895
Temp (°F)	60	58	55	55	56	56	54	56	*	56
Turbidity (NTU)	2.01	2.85	2.69	6.48	7.45	11.5	9.64	4.2	*	6.19
Eh (mv)	-57	-72	-138	60	137	-164	-161	-142	*	-74
Dissolved Oxygen	3.11	5.65	2.11	5.79	4.14	1.56	1.70	1.67	*	5.71
Chloride	77.4	164	32.7	225	29.4	16.0	64.3	46.5	45.2	82.6
Fluoride	0.49	< 0.20	0.25	< 0.20	< 0.20	< 0.20	0.46	0.42	0.41	0.24
Sulfate	1,320	95.3	95.4	737	354	325	12.4	193	205	107
Alkalinity	270	190	300	1,190	440	330	440	610	620	280
Total Dissolved Solids	2,310	695	625	2,680	1,110	855	590	1,030	1,100	565
Arsenic	< 0.005	< 0.005	0.024	< 0.005	0.020	0.055	< 0.005	< 0.005	< 0.005	< 0.005
Arsenic (Dissolved)	< 0.005	< 0.005	0.019	< 0.005	0.016	0.050	< 0.005	< 0.005	< 0.005	< 0.005
Barium	0.026	0.141	0.052	0.060	0.080	0.132	0.106	0.119	0.120	0.116
Boron	0.408	0.289	4.04	1.08	1.38	2.41	1.62	1.20	1.19	0.658
Calcium	454	61.3	91.2	425	299	219	93.7	295	266	79.6
Magnesium	44.0	16.2	14.3	175	25.4	21.7	24.9	28.9	28.9	20.1
Mercury, ng/L	0.7	< 0.5	1.0	1.9	7.8	< 0.5	7.0	< 0.5	< 0.5	< 0.5
Potassium	7.45	6.94	21.8	16.7	11.2	10.2	16.4	11.5	11.4	9.02
Sodium	87.1	168	35.7	167	29.8	13.8	38.8	22.9	23.0	85.2
Radium 226 + 228, pCi/L	1.83	1.03	0.50	1.40	2.15	0.77	1.19	1.41	1.30	0.52

Well CCR-9, located approximately 50 feet south of Well CCR-2, showed non-detect concentrations for both total and dissolved arsenic. Similarly, Well CCR-10, located approximately 260 feet north-northwest of Well CCR-2, did not contain measurable levels of total or dissolved arsenic. Therefore, the widest potential extent of the arsenic plume adjacent to the Niagara River is approximately 300 feet, which represents the distance between Wells CCR-9 and CCR-10. It is noted that Well A-2 is located adjacent to Well CCR-10 but is screened within the bedrock, therefore representing a different monitoring zone. Well CCR-10 was installed to determine whether total arsenic was identified in the groundwater of the overburden layer in which CCR-2 is screened. Therefore, Well A-2 was not considered in delineating the estimated width of the plume.

As shown in Table 5.3.3-3, neither total arsenic nor dissolved arsenic were detected in any of the surface water samples collected.

Table 5.3.3-3: Summary of Surface Water Analytical Results—June 2019 Investigation			
Parameter	Concentration (mg/L) unless noted		
	Equalization Basin North (EQ-1)	Equalization Basin South (EQ-2)	South Settling Pond
pH (SU)	8.09	8.87	8.70
Spec. Cond. (µmhos/cm)	1,469	144	854
Temp (°F)	75	76	74
Turbidity (NTU)	4.02	8.6	4.55
Eh (mv)	54	19	13
Dissolved Oxygen	8.94	6.99	10.76
Chloride	19.5	13.4	137
Fluoride	< 0.20	< 0.20	0.28
Sulfate	921	6.61	82.7
Alkalinity	31	36	150
Total Dissolved Solids	1,540	120	460
Arsenic	< 0.005	< 0.005	< 0.005
Arsenic (Dissolved)	< 0.005	< 0.005	< 0.005
Barium	0.019	0.011	0.139
Boron	0.188	< 0.05	0.208
Calcium	335	13.3	44.6
Magnesium	33.9	1.09	14.3
Mercury, ng/L	0.9	25.7	0.9
Potassium	9.71	0.663	5.51
Sodium	29.7	8.60	98.2
Radium 226 + 228, pCi/L	0.77	0.59	0.87

5.3.4 Piper Diagram Analysis

Utilizing the cation/anion data from Tables 5.3.3-2 and 5.3.3-3, a geochemical “fingerprint” comparison was performed to determine whether the water geochemistry observed at the monitoring wells and/or the water bodies (South Settling Pond and the Equalization Basins) are similar. Piper diagrams are commonly used to evaluate the similarity of groundwater geochemistry at multiple observation points and to:

1. Identify likely sources of groundwater impacts when multiple sources are present, and/or
2. Link impacted areas to help delineate the extent of a contaminant plume.

Geochemistry piper diagrams plot the proportion of dependent chemical constituents. Groundwater that flows through a medium leaching these constituents will generally exhibit clustered data groups at downgradient observation points. These data points represent similar ratios of chemical constituent levels.

As shown in Figure 4, no discernible patterns or linkages were able to be made through this analysis, rendering it inconclusive. The chemical constituent ratios indicate that wide variability is observed across the study area, likely due to the fact that the site has been developed over multiple decades through the placement of uncontrolled fill, which varies in its physical and chemical composition. Therefore, groundwater flowing through the uncontrolled fill will exhibit different chemical constituent ratios based on its location within the site.

5.3.5 Summary

As part of the June 2019 ACM field investigation, soil, groundwater, and surface water were sampled at multiple locations across the study area for the presence of arsenic. The following major conclusions are noted:

1. CCR (fly ash) has been used as a fill material across much of the site and is present outside of the South Settling Pond, as documented by the boring logs and available historic information.
2. Arsenic was measured in five of the seven soil boring locations, within samples collected from the fill materials.
3. SPLP testing indicates that arsenic does not have a propensity to leach from the fill and enter groundwater. Measured concentrations of arsenic were only detected in the leachate generated from SPLP testing of fill materials in boring CCR-8.
4. Cation and anion evaluations of water samples show wide variability between groundwater wells and surface water bodies. This likely arises from the variation of the physical and chemical composition of the fill. The use of standard methods for

delineating plumes through hydrogeologic units is not applicable for the study area, as the fill thickness/type is not uniform across the site (as a geologic unit would be), resulting in altered geochemical signatures.

5. Total arsenic is present in groundwater samples downgradient of the South Settling Pond, as represented by Wells CCR-2, CCR-7, and CCR-8. The arsenic plume is generally bounded by Wells CCR-9 and CCR-10 on the downgradient side adjacent to the Niagara River.
6. Dissolved arsenic in Wells CCR-2, CCR-7, and CCR-8 makes up a significant fraction of the total arsenic concentrations observed in groundwater.
7. Arsenic was not detected in any of the surface water samples collected from the South Settling Pond and the two Equalization Basins.

6.0 Characterization of Nature and Extent of Release

6.1 Overview

Groundwater near the South Settling Pond is monitored by a network consisting of four wells, including Well CCR-3 (upgradient), and Wells A-2, CCR-1, and CCR-2 (downgradient). This network is designed to provide early detection of possible releases to groundwater. The Pond was transitioned into the CCR Assessment Monitoring Program in March 2018 following the review of results from the October 2017 Detection Monitoring event. Since then, multiple rounds of Assessment Monitoring have been conducted, and the results for CCR Appendix IV constituents subjected to review and comparison against Groundwater Protection Standards established specific for the Pond. Results from October 2018 Assessment Monitoring event revealed the presence of arsenic at a concentration above the corresponding Groundwater Protection Standard in downgradient Well CCR-2. This finding was ultimately deemed as an SSL relative to the Groundwater Protection Standard, and thus triggering the CCR Rule obligation for investigation and assessment of potential corrective measures.

As documented herein, an investigation to assess the nature and extent of groundwater impacts was completed in May/June 2019 pursuant to §257.95(g)(1-3) of the CCR Rule. The investigation included the advancement of seven soil borings into proximal fill/fly ash materials outside of the Pond boundary; collection of nine soil samples for laboratory analysis of total and SPLP arsenic; collection of groundwater samples from four existing monitoring wells and five newly installed monitoring wells; and the collection of surface water samples from the Pond and both Equalization Basins. Sampling of fill material/fly ash was completed to assess if those materials could be leaching into site groundwater and contributing to the elevated arsenic concentration in downgradient Well CCR-2.

Groundwater flow in proximity to the Pond is generally from northeast to southwest in the direction of the Niagara River. Potential releases from the Pond would generally migrate along this flow path. As discussed in Section 5.3, groundwater impacts with respect to arsenic are limited to Wells CCR-2, CCR-7, and CCR-8. The impacts have been laterally characterized to the northeast by upgradient Well CCR-3; to the southeast by CCR-1, CCR-9, and CCR-11; and to the west-northwest by CCR-10, each reporting total arsenic below the Groundwater Protection Standard.

6.2 Potential Risks to Human Health & Environment

Constituents of potential concern (COPC) found in groundwater beneath the site include those CCR Appendix IV constituents that exceed health-based guidelines (Maximum Contaminant Levels, Regional Screening Levels, or site-specific background levels) established under the

National Primary Drinking Water Regulations and updates to the CCR Rule issued in July 2018. For the Pond, those constituents are limited to arsenic only, which serves as the focus for the investigative activities recently undertaken.

6.2.1 Exposure Pathways

In order for COPCs to pose a risk to human health or the environment, complete exposure pathways must be present whereby receptors regularly come into contact with elevated concentrations of the COPCs. Potential exposure pathways include:

- Ingestion of impacted groundwater through wells
- Release of impacted groundwater to Niagara River surface water

Groundwater Ingestion. There are no potable water wells located on the Huntley Station property. The site resides within an area that has been used exclusively for industrial purposes for nearly the past 100 years, and the facility receives water from the Town of Tonawanda. Ingestion of impacted groundwater is, therefore, not a complete exposure pathway for receptors.

Niagara River. Impacted groundwater has been observed downgradient from the Pond at concentrations exceeding the arsenic Groundwater Protection Standard in Well CCR-2. Well CCR-2 is located approximately 50 feet from the Niagara River, and essentially on the Huntley Station property boundary. Groundwater data have not been collected between Well CCR-2 and the Niagara River to affirm/negate the presence of arsenic in this reach.

It is noted that while this exposure pathway may be considered potentially viable based on groundwater flow direction toward the Niagara River, the large degree of mixing and assimilative capacity of the Niagara River is very likely to result in total arsenic concentrations that remain protective with regard to possible human and ecological receptors.

6.2.2 Comparison to Health Standards

Environmental samples were collected from soil, groundwater, and surface water as part of the 2019 investigation. A comparison of the analytical results generated during the investigation to relevant and appropriate health standards is presented below.

Groundwater

Groundwater samples collected from the four existing CCR monitoring wells and the five new wells installed during the 2019 investigation were submitted for laboratory analysis of total and dissolved arsenic. The results are summarized on Table 6.2.2-1.

Table 6.2.2-1: Summary of Arsenic Results in Groundwater—June 2019 Investigation

Well	Well Description	Analysis	Result (mg/L)	Groundwater Protection Standard ¹ (mg/L)
A-2	Existing, downgradient	Total / Dissolved Arsenic	<0.005 / <0.005	0.016
CCR-1	Existing, downgradient	Total / Dissolved Arsenic	<0.005 / <0.005	0.016
CCR-2	Existing, downgradient	Total / Dissolved Arsenic	0.024 / 0.019	0.016
CCR-3	Existing, upgradient	Total / Dissolved Arsenic	<0.005 / <0.005	0.016
CCR-7	New, downgradient	Total / Dissolved Arsenic	0.020 / 0.016	0.016
CCR-8	New, downgradient	Total / Dissolved Arsenic	0.055 / 0.050	0.016
CCR-9	New, downgradient	Total / Dissolved Arsenic	<0.005 / <0.005	0.016
CCR-10	New-downgradient	Total / Dissolved Arsenic	<0.005 / <0.005	0.016
CCR-11	New, downgradient	Total / Dissolved Arsenic	<0.005 / <0.005	0.016

¹ Groundwater Protection Standard for total arsenic was derived through statistical evaluation of samples collected from upgradient Well CCR-3.

As shown, total arsenic was reported at concentrations exceeding the Groundwater Protection Standard in three of the nine wells sampled. Total arsenic was reported in Well CCR-2 at a similar concentration (0.024 mg/L) to what was reported in October 2018 (0.023 mg/L), with both values representing an exceedance of the Groundwater Protection Standard. Well CCR-9 was installed approximately 50 feet east-southeast of Well CCR-2, screened within a similar interval, and showed non-detectable levels of total arsenic. The total arsenic impacts in CCR-2 are laterally characterized to the west-northwest by newly installed Well CCR-10, which also showed non-detect concentrations of total arsenic. Newly installed Wells CCR-7 and CCR-8 (downgradient of the Pond) each showed total arsenic concentrations above the Groundwater Protection Standard.

Soil/Fill/Fly Ash

Nine soil samples were collected from seven soil borings for laboratory analysis of total and SPLP arsenic. The results are summarized in Table 6.2.2-2.

Table 6.2.2-2: Summary of Arsenic Results in Fill / Fly Ash—June 2019 Investigation					
Boring Location/Sample Depth Interval	Analysis	Result	Groundwater Protection Standard ¹ (mg/L)	Unrestricted Use Soil Cleanup Objective	Industrial Use Soil Cleanup Objective
CCR-7 (5-7 ft)	Total Arsenic	<0.280 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	<0.050 mg/L	0.016	---	---
CCR-8 (5-7 ft)	Total Arsenic	56.0 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	0.168 mg/L	0.016	---	---
CCR-8 (10-12 ft)	Total Arsenic	58.6 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	<0.050 mg/L	0.016	---	---
CCR-9 (5-7 ft)	Total Arsenic	19.0 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	<0.050 mg/L	0.016	---	---
CCR-10 (5-7 ft)	Total Arsenic	16.9 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	<0.050 mg/L	0.016	---	---
CCR-10 (10-12 ft)	Total Arsenic	<0.308 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	<0.050 mg/L	0.016	---	---
CCR-11 (5-7 ft)	Total Arsenic	8.42 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	<0.050 mg/L	0.016	---	---
CCR-12 (5-7 ft)	Total Arsenic	<0.310 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	<0.050 mg/L	0.016	---	---
CCR-13 (5-7 ft)	Total Arsenic	79.2 mg/kg	---	0.11 mg/kg ²	12 mg/kg ²
	SPLP Arsenic	<0.050 mg/L	0.016	---	---

¹ Groundwater Protection Standard for total arsenic was derived through statistical evaluation of samples collected from upgradient Well CCR-3.

² Soil Cleanup Objective published in New York State Brownfield Cleanup Program, Development of Soil Cleanup Objectives Technical Document, Table 5.6-1 (NY State DEC and NY State DOH, September 2006). Mg/kg = milligrams per kilogram.

Total arsenic exceeded Unrestricted and Industrial Use Soil Cleanup Objectives published by the NYSDEC and New York State Department of Health in five of the nine samples collected. Further assessment of those impacts via SPLP analysis revealed a measurable leachate concentration only from one boring location (CCR-8 @ 5-7 feet) that would comparatively exceed the Groundwater Protection Standard. This further suggests a decreased tendency for leaching of arsenic from the fill into the groundwater.

Surface Water

Three surface water samples were collected for laboratory analysis of total and dissolved arsenic, with the results summarized in Table 6.2.2-3. No detectable concentrations were reported.

Table 6.2.2-3: Summary of Arsenic Results in Surface Water—June 2019 Investigation		
Location	Analysis	Result (mg/L)
South Settling Pond	Total / Dissolved Arsenic	<0.005 / <0.005
Equalization Basin North (EQ-1)	Total / Dissolved Arsenic	<0.005 / <0.005
Equalization Basin South (EQ-2)	Total / Dissolved Arsenic	<0.005 / <0.005

7.0 Corrective Measures Assessment

7.1 Overview

The principal objective of this ACM is to identify potentially applicable and feasible remedial approaches to prevent an off-site release of total arsenic from the facility. Each potential corrective measure is evaluated in this section on the following criteria, in accordance with §257.96(c):

1. The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination.
2. The time required to begin and complete the remedy.
3. The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).

The corrective measures presented below in Sections 7.2 and 7.3 include methods to prevent future releases and to ensure that the current plume is either captured and removed or immobilized to prevent off-site migration. These include the following:

1. Source Control:
 - a. Closure in Place: Install a low-permeability, synthetic cap that is graded to prevent ponding water to reduce infiltration of surface water to groundwater, thereby isolating the CCR material.
 - b. Closure by Removal: Remove the remaining volume of CCR materials from the Pond.
2. Off-Site Migration Prevention:
 - a. Monitored Natural Attenuation (MNA)
 - b. Groundwater Extraction and Treatment
 - c. Impermeable Barrier (Slurry Wall) Coupled with Upgradient Water Capture and Treatment
 - d. Permeable Reactive Barrier (PRB)
 - e. In-Situ Injection of a Reactive Compound
 - f. Phytotechnologies

7.2 Source Control Corrective Measures

Source control measures would be implemented to prevent the further release of arsenic from the Pond. It is noted, however, that these methods alone will not address the current arsenic plume and should, therefore, be used in conjunction with the additional methods of plume management discussed in Section 7.3.

Per §257.102(a), a CCR surface impoundment must be closed either by leaving the CCR in place and installing a final cover system or through removal of the CCR and decontamination of the CCR unit. These methods are both identified as appropriate source control measures. Closure must be completed within 5 years of ceasing operations, in accordance with §257.102(f)(1)(ii).

7.2.1 Closure in Place

Overview

The existing Closure Plan (GZA, 2016) for the Pond calls for closure in place. The intent of in-place closure is to reduce the amount of precipitation and surface waters infiltrating into the unit, thereby reducing the amount of leachate created that could potentially impact site groundwater. The existing Closure Plan identifies a final cover that meets all requirements of the CCR Rule and the NYSDEC. The final cover includes:

- Eighteen inches of earthen material with a permeability no greater than 1×10^{-5} centimeters per second, and
- Six inches of vegetated topsoil.

If this remedy were selected, modifications to the current final cover design would be contemplated to enhance performance, including:

- Increasing the thickness of the earthen layers to decrease infiltration rates
- Specifying lower permeabilities to decrease infiltration rates
- Incorporating geosynthetics as an additional barrier layer, such as polyethylene geomembranes (high density polyethylene or linear low density polyethylene) or geosynthetic clay liners.

The most significant feature of closure-in-place involves the regrading of the unit to prevent standing water. For this surface impoundment, it is likely that clean structural fill will be imported from off site and placed in the Pond until positive drainage is achieved. This regrading will eliminate surface water contact with the CCR and shed the water to other areas of the site.

Once the final cover is installed, post-closure care activities will be required including groundwater monitoring, maintenance, and inspections until groundwater conditions meet the regulatory requirements with no exceedances of Groundwater Protection Standards.

Performance

The placement of clean fill within the Pond will direct rain and surface water away from the CCR, which will be buried at depth. Installing the low-permeability final cover across the Pond will reduce infiltration in this area. This method is likely to decrease or eliminate future impacts from the CCR within the Pond. Design modifications such as the incorporation of geosynthetics are likely to increase the performance and effectiveness of the remedy.

Reliability

Once installed, the capped and closed area is a passive system that will minimize contact with the buried CCR. While it will not be actively managed, the final cover will require post-closure inspections and routine maintenance including mowing and erosion control to ensure that it continues to meet design specifications.

Ease of Implementation

A Closure Plan has already been developed that details closure-in-place. As such, major design considerations, timelines, and implementation strategies have already been vetted. Prior to commencing closure construction, permit-level design drawings, technical specifications, and quality assurance/quality control plan documents would need to be finalized.

Standard construction methods will be employed to construct the final cover, using readily available equipment. Implementation of this remedy is deemed relatively easy.

Safety Impact

This alternative will provide a low safety impact to the site workers, as CCR will not be removed, minimizing exposure. All construction activities will be completed in a safe manner and site workers will use the appropriate personal protective equipment (PPE).

Cross-Media Impacts

The existing Closure Plan specifies that the Pond and CCR should be dewatered prior to the placement of fill. As a precaution against cross-media impact, surface water and/or sediment sampling should be considered to determine appropriate water management methods as it is extracted. It is noted that arsenic was not present in the grab surface water sample collected during the 2019 investigation. No other impacts to site soils, groundwater, ambient air, or the Niagara River are likely during or after cap installation.

Control of Exposure to Residual Contamination

Due to the CCR burial-in-place utilized in this method, residual contamination is unlikely.

Time Required to Initiate and Complete

This alternative can be implemented during one construction season once final design and construction documents are completed.

Institutional Requirements

The design and construction of a cap will require notification to NYSDEC, documentation of construction activities, and posting of documentation as required by the CCR Rule.

7.2.2 Closure by Removal

Overview

Closure by removal would include the removal of all CCR material from the Pond. This closure method would provide the greatest environmental protection due to the fact that no CCR material would remain within the Pond. The material would be disposed of at Huntley's CCR Rule-compliant and lined landfill in Tonawanda, New York. The resulting area after excavation could remain as open water or be regraded at the discretion of the owner.

Once the CCR is removed, post-closure care activities will be required including groundwater monitoring, maintenance, and inspections until groundwater conditions meet the regulatory requirements with no exceedances of Groundwater Protection Standards.

Performance

Closure by removal of CCR material from the Pond would remove all potential for future CCR-caused groundwater impacts from the Pond.

Reliability

The method provides high reliability because future groundwater impacts stemming from CCR cannot occur without source material.

Ease of Implementation

The existing Closure Plan would be required to be updated to include closure by removal. Major design considerations, timelines, and implementation strategies would need to be updated and certified by a professional engineer licensed in the State of New York. The closure plan would need to be posted to NRG's publicly accessible website.

Closure construction activities would require long-arm excavators or other appropriate dredging equipment. Construction would be fairly easy to implement.

Safety Impact

This alternative would provide a moderate safety risk to site workers. Site workers would be exposed to CCR material, and there would be an increased chance for a material release due to excavation activities. All construction activities would be completed in a safe manner and site workers will use appropriate PPE.

Cross-Media Impacts

Cross-media impacts are unlikely. In the event that dewatered CCR becomes too dry, it may become airborne. No other additional impacts to site soils, groundwater, ambient air, or the Niagara River are expected during or after CCR removal.

Control of Exposure to Residual Contamination

Best management practices and PPE would be used to prevent residual contamination.

Time Required to Initiate and Complete

It is assumed that the closure plan updates and associated design and construction documents can be completed within six months. Closure by removal can be completed in one construction season.

Institutional Requirements

This remedy will require notification to NYSDEC, documentation of construction activities, and posting of documentation as required by the CCR Rule.

7.3 Off-Site Migration Prevention

This section evaluates methods to prevent total arsenic from moving off site. It is recognized that the plume has been detected within approximately 50 feet of the Niagara River in Well CCR-2. Potential methods for preventing off-site migration generally involve immobilization of the arsenic or treatment of captured groundwater to remove the arsenic.

7.3.1 Monitored Natural Attenuation

Overview

MNA relies on natural processes to sequester contaminants of concern in soil and groundwater, including:

- Microbial biodegradation: microbial action that breaks down a contaminant into a different and safe chemical makeup
- Sorption: adherence of a contaminant in soils, rendering it immobile
- Dilution: concentrations are diluted to safe levels
- Evaporation: phase changes from liquids to gases

- Chemical reactions: reactions with natural substances in the soil may convert contaminants into less harmful forms
- Other: dispersion, volatilization, radioactive decay, chemical or biological stabilization, transformation

In the appropriate setting, MNA can be a preferred remedy due to its limited disturbance, low cost of implementation, and lack of required ongoing maintenance. MNA is selected when any contaminant source has been removed and only low concentrations of contaminants remain in soil or groundwater. Additionally, MNA can work well when there are relatively long flow paths prior to reaching a receptor. Groundwater quality is monitored while natural attenuation occurs to determine treatment effectiveness.

It is noted that arsenic is an inorganic constituent. Because inorganic constituents typically do not degrade, some of the above listed natural attenuation processes are not effective. Methods that are successful in controlling the mobility of subsurface arsenic include sorption, precipitation, and dissolution processes that are related to redox reactions with iron and sulfur species within the soil.

Performance

The performance of MNA is dependent on the concentration of contaminants and the ability of a substance to degrade over a long flow path. Due to the proximity of the plume to the Niagara River, it is unlikely that sorption, precipitation, and dissolution processes can successfully manage the arsenic plume within such a short flow path.

Reliability

While MNA can be a reliable method of reducing contaminants in many situations, it is unlikely that natural processes will be able to reduce the contaminant plume to acceptable concentrations over the short flow path to the Niagara River. Therefore, MNA is considered unreliable in this circumstance.

Ease of Implementation

MNA is one of the easiest methods of contaminant management due to the fact that no technologies need to be installed. MNA is inexpensive, with costs associated with monitoring groundwater quality to ensure effectiveness.

Safety Impact

Invasive work in the impacted area is not required, reducing exposure risk to workers over other methods.

Cross-Media Impacts

Due to the lack of invasive construction activities, cross-media impacts are unlikely to occur.

Control of Exposure to Residual Contamination

Safe work practices would be defined and implemented to reduce the risk of injury or exposure to contaminated groundwater.

Time Required to Initiate and Complete

Implementation of an MNA system and associated groundwater monitoring would happen relatively quickly, but completion time is anticipated to be lengthy to achieve Groundwater Protection Standards.

Institutional Requirements

Due to the known arsenic impact, this remedial strategy would need to be approved as part of the BCA. It is unlikely that it would be approved due to the known location of the plume at the site boundary and the short flow path to the Niagara River.

7.3.2 Groundwater Extraction and Treatment

Overview

Extraction wells and/or a groundwater collection trench could be installed to capture contaminated groundwater, which would then be pumped into a treatment system. The Station currently maintains an on-site wastewater treatment plant, which may be able to accommodate treatment of the arsenic-impacted groundwater. The extraction wells would act as a hydraulic containment system, which would prevent impacted groundwater from reaching the Niagara River. Following treatment to acceptable standards, the treated effluent would be discharged presumably to the Niagara River.

Performance

Groundwater extraction and treatment is a relatively common method of handling impacted groundwater and is effective with proper installation, operation, and maintenance. However, due to the proximity of the leading edge of the plume to the Niagara River, pumping is likely to draw in a significant amount of river water, requiring extensive pumping efforts to ensure that on-site groundwater is not released. The installation of a groundwater extraction system is unlikely to perform successfully without additional measures to control the flow of river water into the extraction network.

Reliability

Generally, pump and treat systems are considered a reliable method of containing and treating contaminated groundwater with correct installation and maintenance. However, as previously stated, it is likely that a pump and treat system, unless coupled with a gradient control method to prevent river water from entering the system, will be unreliable. In the event that it can be appropriately sized, proper installation, operation, and maintenance are necessary for the long-

term success of a pump and treat system. The long-term reliability of the pumps and extraction wells is dependent upon routine inspection and maintenance.

Ease of Implementation

Site conditions will require evaluation in the area of the extraction well/trench network to provide detailed information regarding lithology and the behavior of water-bearing units. Of particular interest will be determining the hydraulic conductivity (also referred to as permeability) of the water-bearing units to determine pump sizes necessary to exceed capacity of the in situ conditions. Groundwater and river levels will need to be evaluated to determine seasonal variation, and groundwater flow modeling may also be required to assist with the design of the system. The existing wastewater treatment plant will need to be evaluated to ensure that it is able to remove total arsenic from the water at the extraction flow rates. Permitting may be required. Groundwater wells will be installed using standard techniques. Routine inspection and maintenance will be necessary in order to ensure that the equipment is kept in proper working order.

Safety Impact

Safety issues to be considered during construction will be exposure to arsenic-contaminated groundwater, electrical work, and accidental release of contaminated groundwater, in addition to general construction safety concerns. Safe work practices will be defined and implemented to reduce the risk of injury or exposure and prevent release of contaminated groundwater.

Cross-Media Impacts

With proper installation, it is not expected that there will be significant or long-term cross-media impacts.

Control of Exposure to Residual Contamination

Residual contamination is unlikely.

Time Required to Initiate and Complete

After design and installation extraction well/trench network and possible modification of the existing wastewater treatment plant, the length of time expected to reach attainment is dependent on the management of the source material (see Section 7.2), the hydraulic conductivity of the water-bearing units, and the concentration of arsenic in the groundwater.

Institutional Requirements

The on-site wastewater treatment facility may need operating and/or treatment permits from local authorities.

7.3.3 Impermeable Barrier (Slurry Wall or Sheet Pile Wall) Coupled with Upgradient Water Capture and Treatment

With this remedial approach, an impermeable barrier (such as a slurry wall) would be placed proximate to the Niagara River along the downgradient width of the plume, generally spanning between Wells CCR-9 and CCR-10. The impermeable barrier would be keyed into competent bedrock to effectively restrict groundwater flowing beneath the site from exiting at this location. In order to prevent groundwater from flowing around the wall, groundwater extraction wells or a trench will be installed on the upgradient side of the impermeable barrier, as described in Section 7.3.2. Water will be pumped to the existing on-site wastewater treatment plant (to be modified if necessary), and the treated effluent discharged in accordance with regulatory requirements.

Performance

This approach will improve the pump and treat solution because it will provide an impermeable barrier that restricts on-site groundwater from flowing into the Niagara River, and also inhibits the Niagara River from recharging the wells and increasing the required pump rates. Similar to the pump and treat system without an impermeable barrier, the system will require long-term management until Groundwater Protection Standards are achieved.

Reliability

A slurry wall has already been installed around the coal pile with demonstrated success. Therefore, the impermeable barrier, if installed correctly, is likely to be reliable. Proper installation, operation, and maintenance are necessary for the long-term success of an impermeable barrier with a pump and treat system. The long-term reliability of the pumps and extraction wells is dependent upon routine inspection and maintenance, as previously described.

Ease of Implementation

The installation of an impermeable barrier is invasive and will require excavation activities to accommodate placement of the barrier. A detailed design will be required to be developed, which will include bentonite/concrete mixture and tie-ins to the bedrock and existing slurry wall. Permitting may be required. Once the impermeable barrier is installed, groundwater flow will be altered. Therefore, groundwater monitoring wells will need to be installed to quantify the revised groundwater flow pattern to ensure that the extraction wells are appropriately located and spaced apart.

Safety Impact

The installation of an impermeable barrier will present exposure risks to both the arsenic-impacted groundwater and to powdered bentonite (a slurry wall construction material). Additional safety issues to be considered during construction will include excavation, electrical work, and accidental release of contaminated groundwater, in addition to general construction safety concerns. Safe

work practices will be defined and implemented to reduce the risk of injury or exposure and prevent release of contaminated groundwater.

Cross-Media Impacts

During installation of the slurry wall, bentonite dust may become airborne. No impacts to site soils, groundwater, or the Niagara River are expected once the wall is installed.

Control of Exposure to Residual Contamination

No residual contamination is anticipated.

Time Required to Initiate and Complete

Design and installation will be a lengthy process in comparison to the other options presented. A field investigation will be required prior to installation to delineate the bedrock along the riverfront. Permitting with the Army Corps of Engineers may be required prior to construction depending on the location of the wall. Evaluation of the wastewater treatment plant capabilities will be required to determine whether arsenic removal is achievable at the plant.

Institutional Requirements

Permits may be required from the Army Corps of Engineers to construct the impermeable barrier and the pump and treat system. Due to the known arsenic impact, this remedial strategy will need to be approved as part of the BCA. Additional land use restrictions may apply to the area after the system has been installed and implemented.

7.3.4 Permeable Reactive Barrier

A PRB is a subsurface barrier wall constructed with a reactive material to treat organic and/or inorganic constituents as they flow through the barrier. A PRB would be installed downgradient of the arsenic source and adjacent to the Niagara River between Wells CCR-9 and CCR-10. Impacted groundwater would flow through the PRB, and the arsenic would be absorbed by the reactive material. The intent is to lower the downgradient concentration of total arsenic in the groundwater below Groundwater Protection Standards. A PRB comprised of zero-valent iron or ferric iron is typically effective for the treatment of arsenic. Site-specific bench-scale testing would be conducted prior to installation to ensure that the PRB would effectively treat the impacted groundwater.

PRBs have been proven effective and practical at passively treating arsenic contamination in groundwater. Despite a higher cost for installation due to the necessity for PRB reagents, a PRB is likely to cost less than a slurry wall with groundwater treatment due to the negated cost of well installation and ongoing treatment costs.

Performance

A well-designed PRB can be effectively used to passively treat groundwater and prevent the potential migration of arsenic to the Niagara River. Site-specific testing will be required to determine the optimal composition and properties of the PRB for treatment of arsenic. Additional monitoring after installation will be conducted as necessary to confirm the PRB is performing as appropriate.

Reliability

A PRB is a very reliable option for the treatment of arsenic if it is properly designed and installed to account for fluctuations over time in the groundwater flow directions and levels. It will not require electricity to operate and is, therefore, more reliable during a power outage than other alternatives. Depending on the time duration required to achieve Groundwater Protection Standards for total arsenic, the reactive constituents may need to be replenished to maintain effectiveness.

Ease of Implementation

Site-specific testing will be required to determine the appropriate constituents to blend into the PRB to ensure that total arsenic is immobilized. Once determined, a detailed PRB design will need to be developed and permitted/incorporated into the BCA. Construction of a PRB is similar to construction of a slurry wall, and typically includes the excavation of a trench that extends into the flow path of the contaminated plume. Installation of the PRB will include backfilling of the designed reactive material in the trench. The material will be placed with a high permeability to ensure flow through the structure is not impeded.

Similar to the slurry wall, construction may be challenging based on the required excavation area being close to the Niagara River. It should be noted that specialized equipment is available for concurrent excavation and backfilling in locations where conventional trenching is not reasonable. Other construction methods can also be implemented, including funneling the groundwater toward the impermeable walls to the PRB for treatment.

Safety Impact

Construction and operation/maintenance of a PRB will expose workers to the arsenic-impacted groundwater during trench excavation and PRB constituents during barrier development. All construction activities will be completed in a safe manner and site workers will use the appropriate PPE.

Cross-Media Impacts

During installation of the reactive barrier, the reagents used within the PRB may become airborne. No impacts to site soils, groundwater, or the Niagara River are expected once the barrier is installed.

Control of Exposure to Residual Contamination

No residual contamination is anticipated.

Time Required to Initiate and Complete

The duration of PRB construction is estimated to be somewhat shorter than that of a slurry wall because the groundwater flow patterns will not be modified and need to be studied, nor will groundwater extraction wells/trenches need to be installed. The engineering design of a PRB will require site-specific testing to ensure the barrier will effectively treat the arsenic. The time required to achieve Groundwater Protection Standards will be based on the reagents selected for the PRB. Long-term monitoring and maintenance will be required to ensure effective performance of the PRB.

Institutional Requirements

Permits may be required from the Army Corps of Engineers to construct the PRB. Due to the known arsenic impact, this remedial strategy will need to be approved as part of the BCA. Additional land use restrictions may apply to the area after the system has been installed and until Groundwater Protection Standards are achieved.

7.3.5 In Situ Injection of a Reactive Compound

Overview

Similar to a PRB, in situ injection consists of injecting a chemical material into the ground to react with the arsenic to stabilize or immobilize the contaminant. The current maximum plume width is estimated to be approximately 300 feet, which represents the distance between two wells (CCR-9 and CCR-10) that did not contain arsenic at detectable levels. In the event that additional monitoring wells were installed between these two wells, it is likely that the actual plume width could be refined and reduced. In the event that the plume is relatively narrow, in situ injection may be a preferred option due to the speed and ease of installation, the minimization of invasive work (e.g., trenching), and the ability to add additional injections as necessary. This approach will require additional site subsurface investigation to ensure proper injection spacing and depth.

Performance

In-situ injection is likely to significantly reduce the mobility of the arsenic in the groundwater. Staggered injections will be used to apply the reagent to ensure that contaminated groundwater cannot flow around the injection sites. When monitoring wells are installed to refine the plume width, additional testing and logging should be performed to refine the understanding of the hydrogeologic setting. Hydraulic conductivity of the overburden fill should be quantified as part of this effort.

Reliability

This alternative has the potential to be very reliable. An added benefit to injection is that additional reagents can be added at a later date to maintain effectiveness. A feasibility study will need to be

completed to determine if the site conditions are conducive for this alternative and which chemical(s) are sufficient to support immobilization of the arsenic. Additional testing and modeling will need to be completed to determine the injection spacing, depth, and length of time this alternative may be effective.

Ease of Implementation

In-situ injection will be one of the easiest and fastest remedial activities to complete and can typically be completed using a Geoprobe rig, which are readily available and cost effective. A pilot-scale study is recommended to be completed to assess the effectiveness of this approach on a site-wide scale.

Safety Impact

In-situ application of chemicals at the site will be a moderately safe alternative with few risks. Chemicals could be injected locally at the site through temporary wells. All treatment activities will be completed in a safe manner and site workers will use appropriate PPE.

Cross-Media Impacts

No impacts to site soils, groundwater, ambient air, or the Niagara River are expected during or after treatment.

Control of Exposure to Residual Contamination

No residual contamination is anticipated.

Time Required to Initiate and Complete

This alternative will require an initial hydrogeologic investigation and bench study that may take one to three months to complete. Injection wells can thereafter be installed relatively quickly. Groundwater monitoring will be required to ensure the injections are effective in immobilizing the arsenic. Additional periodic injections may be required.

Institutional Requirements

The in situ injections will require permitting and design documentation with the appropriate state and local agencies and incorporation into the BCA.

7.3.6 Phytotechnologies

Overview

Under appropriate conditions, a variety of phytotechnology techniques can be employed to handle contaminants in soil and groundwater, including:

- Phytodegradation: Contaminants are broken down by plant tissue enzymes.
- Phytoextraction: Contaminants are sequestered within plant tissue.

- Phytohydraulics: Contaminated water is removed by plants through transpiration.
- Phytosequestration: Contaminants are sequestered in plant roots and stems.
- Phytovolatilization: Contaminants are volatilized through transpiration.
- Rhizodegradation: Contaminants are degraded by phytochemicals in the rhizosphere.

Some sites contaminated with arsenic have been able to achieve attainment with phytoextraction using certain types of ferns that are able to sequester arsenic within their plant tissue. For the Huntley facility, it is not expected that phytoextraction will be successful because this method is only effective for sites that have shallow contamination, since the fern's roots only reach approximately 12 inches of depth (U.S. Environmental Protection Agency, Phytotechnologies for Site Cleanup, EPA 542-F-10-009, 2010).

Performance

None of the phytotechnology remediation mechanisms will perform well under the conditions identified at the site. Phytotechnology is not an appropriate remediation method for arsenic unless contamination is shallow (less than the depth of plant roots).

Reliability

Reliability of phytotechnology remediation mechanisms is dependent on depth of contamination, concentration of contaminants, and the type of phytotechnology remediation mechanism employed. It is not expected that phytotechnology will be a reliable remediation method for the site, due to the depth of arsenic contamination and the potential concentration of contaminants.

Ease of Implementation

Phytotechnology remediation mechanisms are relatively simple and inexpensive to install. The appropriate vegetation will be planted in strategic areas to encourage one of the phytotechnology remediation mechanisms to take place.

Safety Impact

This option will not involve significant construction work leading to potential exposures. General workplace safety issues will be considered on site. Safe work practices will be defined and implemented to reduce the risk of injury.

Cross-Media Impacts

No cross-media impacts are expected.

Control of Exposure to Residual Contamination

No residual contamination is expected.

Time Required to Initiate and Complete

Design and installation of phytotechnology approach can happen quickly, but it is not expected that a phytotechnology mechanism will be successful at the site.

Institutional Requirements

Permits would not be required. This method, however, would likely be incorporated into the BCA.

8.0 Path Forward

8.1 Selection of Remedy

Following the completion and submittal of this ACM Report, and as soon as feasible, a remedy for the Pond is to be selected in accordance with the provisions of §257.97 and which meets the minimum standards contained in §257.97(b)(1-5), as follows:

- Be protective of human health and the environment;
- Attain the Groundwater Protection Standard as specific pursuant to §257.95(h);
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in Appendix IV to this part into the environment;
- Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems; and
- Comply with standards for management of wastes as specified in §257.98(d).

The information presented in Section 7.0, along with findings from the BCP investigation (see Section 8.1.1) and input and considerations from the public (see Section 8.1.2), will assist in the remedy selection.

8.1.1 Coordination with Brownfield Program Findings and State of New York Guidance

As noted in prior sections of this report, a portion of the Huntley Station referred to as the South Parcel (which also includes the Pond) has been enrolled in the NYSDEC BCP. This parcel will be subject to a dedicated investigation in accordance with an approved Remedial Investigation Work Plan. The investigation will be performed per the protocols contained in the NYSDER publication entitled, “DER-10, Technical Guidance for Site Investigation and Remediation (May 2010).” Within this guidance document and similar to the CCR Rule, specific objectives for remedy selection are outlined to address impacted media, including groundwater. Accordingly, it is recognized that a close level of coordination will be required between the activities performed to support the CCR Rule and the BCP in order to arrive at a remedy that is responsive and compliant with the objectives of both programs. As the work and investigative activities for each program are on separate timelines, this aspect of the coordination must also be considered.

8.1.2 Public Meeting Prior to Remedy Selection

With regard to the CCR Rule and per §257.96(e), a public meeting must be held 30 days prior to remedy selection in order to inform interested/affected parties and stakeholders of the results of

the ACM and to allow the opportunity for public comment/input. Published advertisement of the meeting in the local newspaper will provide appropriate advance notice to the public. Per §257.105(h)(11), documentation of the completed meeting will be placed into the Huntley Station operating record.

8.1.3 CCR Progress Reporting

Until the final remedy is selected and designed, semiannual progress reports must be prepared in accordance with §257.97(a). These reports must be placed in the Huntley Station operating record per §257.105(h)(12), noticed to the State Director per §257.106(h)(9), and posted to the publicly accessible website per §257.107(h)(9). Upon selection of the final remedy, a dedicated report must be prepared (and certified by a qualified professional engineer) to summarize the remedy and its ability to satisfy the standards contained in §257.97(b)(1-5) through evaluation of the factors listed in §257.97(c)(1-4). The remedy selection summary report will also be placed in the facility operating record, noticed to the State Director, and posted to the public website per §257.105(h)(12), §257.106(h)(9), and §257.107(h)(9), respectively.

8.2 Implementation of Remedy

The selected remedy will be implemented in accordance with the requirements of §257.98, which further mandate that remedial activities begin within 90 days of remedy selection. Specific requirements under §257.98(a)(1-3) address significant aspects of remedy implementation including the need to establish an effective groundwater monitoring program and the enactment of potential interim measures to mitigate immediate risks to human health and/or the environment. Consideration of the factors listed in §257.98(a)(3)(i-vii) will be utilized to determine the possible need for interim measures, which if undertaken, would need to be generally consistent with the objectives and elements of the overall selected remedy.

8.2.1 Timeline

As noted above, activities supporting the implementation of the remedy (likely beginning with remedial design) must be initiated within 90 days of remedy selection. Per §257.97(d), the overall projected schedule for remedy implementation must show completion within a reasonable period of time and must be documented in the remedy selection summary report discussed in Section 8.1.3. Development of the schedule will take into account the factors listed in §257.97(d)(1-6), including considerations such as nature and extent of contamination, anticipated achievement of Groundwater Protection Standards, and ongoing risks to receptors, among other relevant aspects. For the Pond, schedule development will also need to consider the timing and availability of additional information from the BCP investigation, which may aid in remedy refinement and design. As previously mentioned, information from the BCP investigation likely will play a role in the efforts leading up to actual remedy selection for the Pond.

8.2.2 *Determination of Success*

Within the context of the CCR Rule, §257.98(c)(1-3) sets forth the criteria that must be met to demonstrate that the remedy can be deemed complete. These criteria are principally focused on achievement of the CCR Groundwater Protection Standards specific to the Pond and verified completion of all other elements of the selected remedy. To comply with §257.98(e), documentation of remedy completion must be prepared and certified by a qualified professional engineer and placed into the Huntley Station operating record per §257.105(h)(13). This documentation will also be noticed to the State Director per §257.106(h)(10) and posted to the publicly accessible website per §257.107(h)(10).

9.0 Qualified Professional Engineer Certification

Name of Professional Engineer: Richard Southorn, P.E., P.G.

Company: Aptim Environmental & Infrastructure, LLC

New York PE Registration Number: 97551

Professional Engineer Seal:



10.0 References

APTIM Environmental & Infrastructure, Inc., January 2019. CCR Compliance Groundwater Monitoring and Corrective Action Annual Report, Huntley Landfill and South Settling Pond.

Code of Federal Regulations, Part 40 §257.90 - §257.98.

Frontier Technical Associates Inc., October 11, 2017. CCR Groundwater Monitoring Network Evaluation. C.R. Huntley Station South Ash Pond.

GZA GeoEnvironmental of New York, February 20, 2015. Pond Embankment Evaluation, Huntley Generating Plant.

GZA GeoEnvironmental of New York, October 14, 2016. CCR Surface Impoundment Design Criteria, Huntley Generating Station.

GZA GeoEnvironmental of New York, October 14, 2016. Existing CCR Surface Impoundment Closure Plan, Huntley Generating Station South Settling Pond.

GZA GeoEnvironmental of New York, March 25, 2019. Remedial Investigation Work Plan, Huntley Power South Parcel Site (C915337).

New York State Department of Environmental Conservation, May 2010. DER-10, Technical Guidance for Site Investigation and Remediation.

Figures

T:\AutoCAD\Projects\NRG\Huntley\Figures\01-Site Features.dwg

File: T:\AutoCAD\Projects\NRG\Huntley\Figures\01-Site Features.dwg
Plot Date/Time: Aug 15, 2019 - 2:16pm
Plotted By: nicholas.villanueva

OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Pittsburgh, PA	8/14/19	--	--	--	--	--



LEGEND:

- EASEMENT OF FORMER ERIE CANAL
- APPROXIMATE SLURRY WALL LOCATION

REFERENCE:

GOOGLE AERIAL PHOTOGRAPH, DATED 10/2016.

S C A L E



500 Penn Center Boulevard,
Suite 900
Pittsburgh, Pennsylvania 15235

HUNTLEY POWER LLC

FIGURE 1

SOUTH PARCEL SITE FEATURES

HUNTLEY GENERATING STATION
TONAWANDA, NEW YORK

T:\AutoCAD\Projects\NRG\Huntley\Figures\02-Well Locations.dwg

File: T:\AutoCAD\Projects\NRG\Huntley\Figures\02-Well Locations.dwg
Plot Date/Time: Aug 15, 2019 - 2:16pm
Plotted By: nicholas.villanueva

OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Pittsburgh, PA	8/14/19	--	--	--	--	--



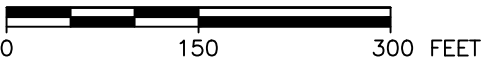
LEGEND:

-  CCR-1
EXISTING CCR
GROUNDWATER
MONITORING WELL
-  CCR-12
2019 SOIL BORING
LOCATION
-  CCR-7
2019 CCR
GROUNDWATER
INVESTIGATION
MONITORING WELL

REFERENCE:

GOOGLE AERIAL PHOTOGRAPH, DATED 10/2016.

S C A L E



500 Penn Center Boulevard,
Suite 900
Pittsburgh, Pennsylvania 15235

HUNTLEY POWER LLC

FIGURE 2
SOIL BORING & MONITORING WELL
LOCATIONS

HUNTLEY GENERATING STATION
TONAWANDA, NEW YORK

File: T:\AutoCAD\Projects\NRG\Huntley\Figures\~03-Potentiometric Surface.dwg
Plot Date/Time: Aug 15, 2019 - 2:16pm
Plotted By: nicholas.villanueva

OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Pittsburgh, PA	8/14/19	--	--	--	--	--



LEGEND:

- CCR-1 EXISTING CCR GROUNDWATER MONITORING WELL
- CCR-12 2019 SOIL BORING LOCATION
- CCR-1 2019 CCR GROUNDWATER INVESTIGATION MONITORING WELL WITH GROUNDWATER ELEVATION MEASURED ON JUNE 21, 2019
- 567 GROUNDWATER ELEVATION CONTOURS
- GROUNDWATER FLOW DIRECTION

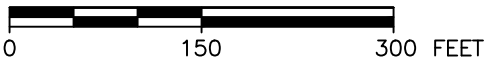
NOTE:

EXISTING MONITORING WELL A-2 WAS EXCLUDED FROM THE POTENTIOMETRIC MAP BECAUSE IT IS A DEEP WELL SCREENED IN A DIFFERENT UNIT.

REFERENCE:

GOOGLE AERIAL PHOTOGRAPH, DATED 10/2016.

S C A L E



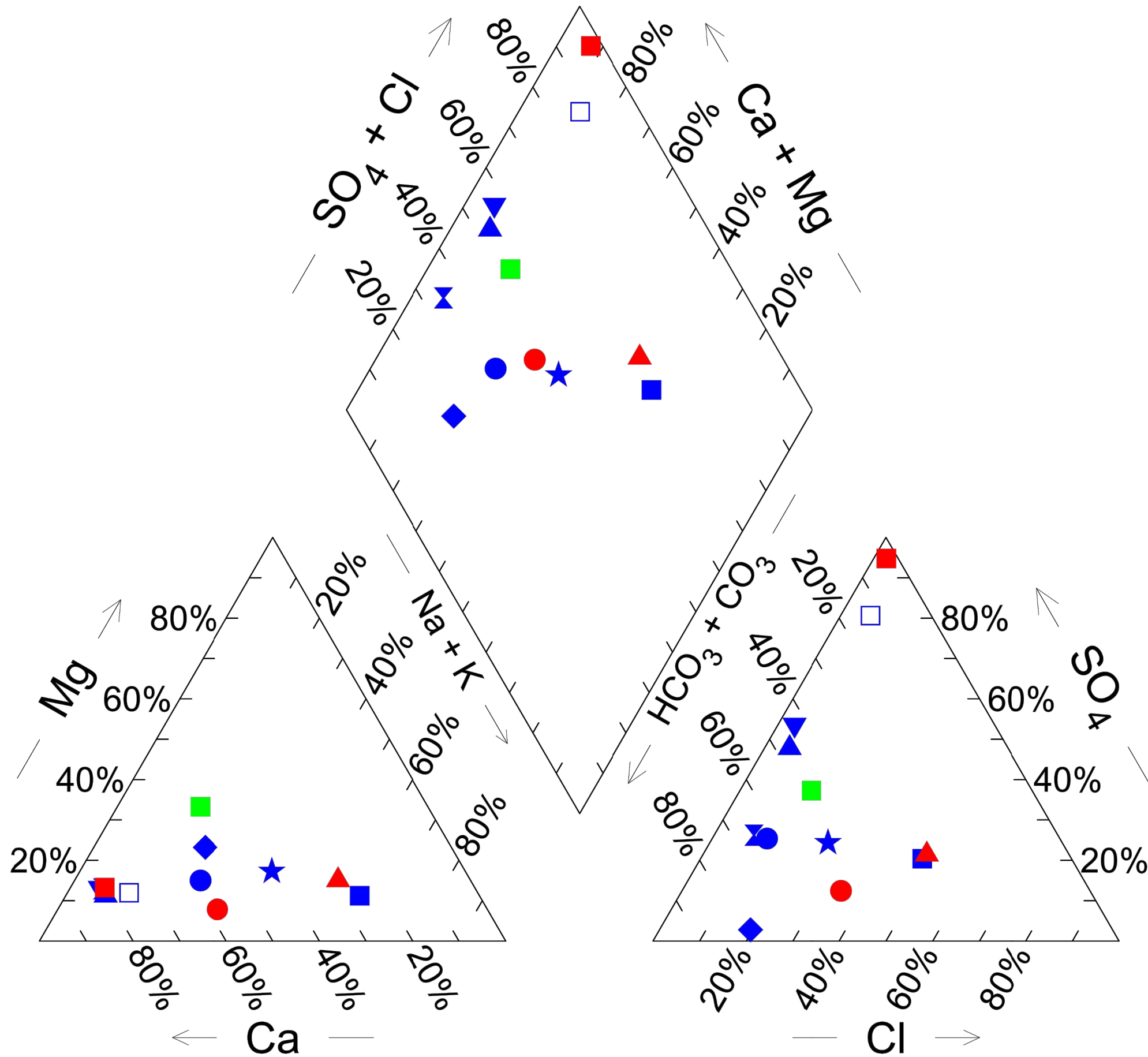
500 Penn Center Boulevard,
Suite 900
Pittsburgh, Pennsylvania 15235

HUNTLEY POWER LLC

FIGURE 3
GROUNDWATER POTENTIOMETRIC MAP
JUNE 21, 2019

HUNTLEY GENERATING STATION
TONAWANDA, NEW YORK

OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Pittsburgh, PA	8/14/19	--	--	--	--	--



LEGEND:

- CCR-3
- CCR-1
- CCR-2
- CCR-7
- CCR-8
- CCR-9
- CCR-10
- CCR-11
- A-2
- EQ-1
- EQ-2
- SSP



500 Penn Center Boulevard,
Suite 900
Pittsburgh, Pennsylvania 15235

HUNTLEY POWER LLC

FIGURE 4
PIPER DIAGRAM
2ND QUARTER 2019 GROUNDWATER
SAMPLES
HUNTLEY GENERATING STATION
TONAWANDA, NEW YORK

Appendix A

Boring Logs and Well Construction Details

A.1—CCR Monitoring Network for South Settling Pond

HOLE NO. CCR-1
SURF. ELEV. _____
G.W. DEPTH See Notes

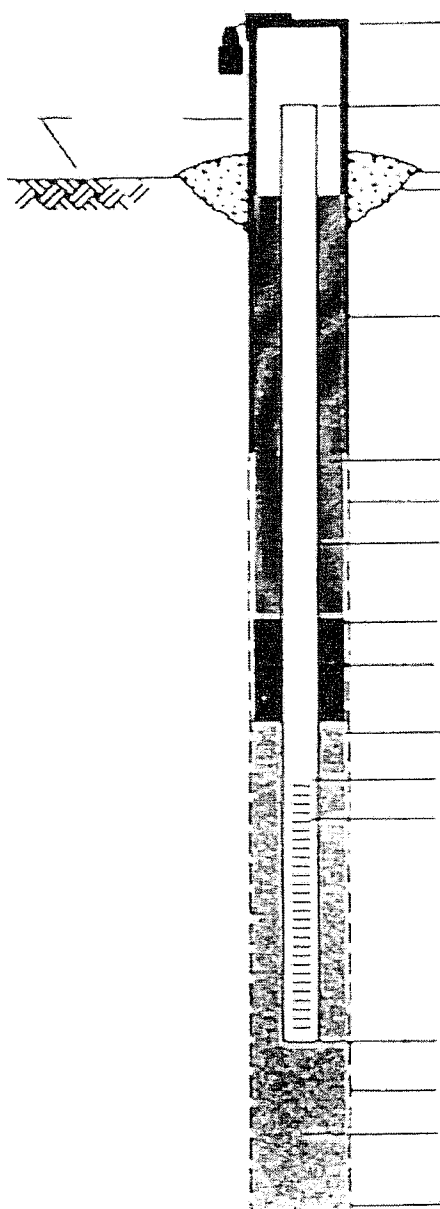
LOCATION: RIVER ROAD
TONAWANDA, NY

DRILL RIG TYPE : CME-550X

MONITORING WELL COMPLETION RECORD



WELL NUMBER: CCR-1	
PROJECT: CCR WELL - HUNTLEY PLANT	DRILLING METHOD: HOLLOW STEM AUGER
PROJECT NUMBER: BD-15-143	GEOLOGIST: N/A
DRILLER: S. WOLKIEWICZ	INSTALLATION DATE(S): 9/15/2015



ELEVATIONS/ TOP OF SURFACE CASING:	
STICK- UP/ TOP OF SURFACE CASING:	
ELEVATION/ TOP OF RISER PIPE:	
STICK- UP/ TOP OF RISER PIPE:	
TYPE OF SURFACE SEAL:	CONCRETE
I.D. OF SURFACE CASING:	4"
TYPE OF SURFACE CASING:	STEEL
TYPE OF BACKFILL:	CEMENT / BENTONITE GROUT
BOREHOLE DIAMETER:	NOMIAL 8"
I.D. OF RISER PIPE:	2.0"
TYPE OF RISER PIPE:	SCHEDULE 40 PVC
DEPTH OF SEAL:	5.1'
TYPE OF SEAL:	BENTONITE CHIPS
DEPTH OF SAND PACK:	8.1'
DEPTH TOP OF SCREEN:	10.7'
TYPE OF SCREEN:	SCHEDULE 40 PVC
SLOT SIZE X LENGTH:	0.010" x 5'
I.D. OF SCREEN:	2.0"
TYPE OF SAND PACK:	#1 SILICA SAND AND #00 SILICA SAND
DEPTH BOTTOM OF SCREEN:	15.7'
DEPTH BOTTOM OF SAND PACK:	15.7'
TYPE OF BACKFILL BELOW OBSERVATION WELL:	#00 SILICA SAND
ELEVATION/ DEPTH OF HOLE:	16.0'

START	9/16/2015
FINISH	9/16/2015
SHEET	1 OF 1

SJB
SERVICES, INC.

HOLE NO.	CCR-2
SURF. ELEV	
G.W. DEPTH	See Notes

PROJECT: CRR WELLS AT HUNLEY PLANT
PROJ. NO.: BD-15-143

LOCATION: RIVER ROAD
TONAWANDA, NY

DEPTH FT.		SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
			0/6	6/12	12/18	N		
5		1	10	3			Brown Clayey SILT, little f-c Sand, tr.brick, tr.organics (moist, FILL) Contains "and" Brick, little fine Gravel Brown GRAVEL, some Silty Clay, little f-c Sand (moist, FILL) Black and Red SAND, little Brick, little f-c Gravel, tr.silt (moist-wet, FILL) Contains tr.organics Becomes Black (wet)	REF = Sample Spoon Refusal
			3	4		6		
		2	3	10				
			50/0.2			REF		
		3	5	5				
10			4	4		9		
		4	4	6				
			10	12		16		
		5	3	6				
			5	12		11		
15		6	5	3				
			1	1		4		
20							Boring Complete at 17.5'	Free Standing Water recorded at 8.5' at Boring Completion Monitoring Well installed at Boring Completion
25								

CLASSIFIED BY: Geologist

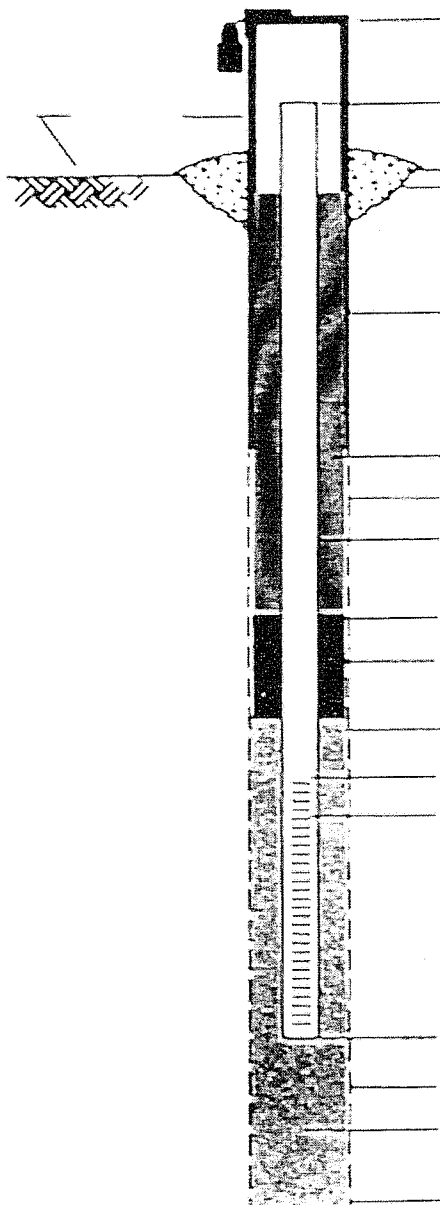
DRILL RIG TYPE : CME-550X

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

MONITORING WELL COMPLETION RECORD



WELL NUMBER: MW-3-15	
PROJECT: CCR WELL - HUNTLEY PLANT	DRILLING METHOD: HOLLOW STEM AUGER
PROJECT NUMBER: BD-15-143	GEOLOGIST: N/A
DRILLER: S. WOLKIEWICZ	INSTALLATION DATE(S): 9/16/2015



ELEVATIONS/ TOP OF SURFACE CASING:	
STICK- UP/ TOP OF SURFACE CASING:	
ELEVATION/ TOP OF RISER PIPE:	
STICK- UP/ TOP OF RISER PIPE:	
TYPE OF SURFACE SEAL:	CONCRETE
I.D. OF SURFACE CASING:	4"
TYPE OF SURFACE CASING:	STEEL
TYPE OF BACKFILL:	#00 SILICA SAND AND CEMENT / BENTONITE GROUT
BOREHOLE DIAMETER:	NOMIAL 8"
I.D. OF RISER PIPE:	2.0"
TYPE OF RISER PIPE:	SCHEDULE 40 PVC
DEPTH OF SEAL:	7.0'
TYPE OF SEAL:	BENTONITE CHIPS
DEPTH OF SAND PACK:	10.5'
DEPTH TOP OF SCREEN:	12.5'
TYPE OF SCREEN:	SCHEDULE 40 PVC
SLOT SIZE X LENGTH:	0.010" x 5'
I.D. OF SCREEN:	2.0"
TYPE OF SAND PACK:	#1 SILICA SAND AND #00 SILICA SAND
DEPTH BOTTOM OF SCREEN:	17.5'
DEPTH BOTTOM OF SAND PACK:	17.5'
TYPE OF BACKFILL BELOW OBSERVATION WELL:	#1 SILICA SAND
ELEVATION/ DEPTH OF HOLE:	17.5'

1 OF 1

SJB
SERVICES, INC.

G.W. DEPTH See Notes

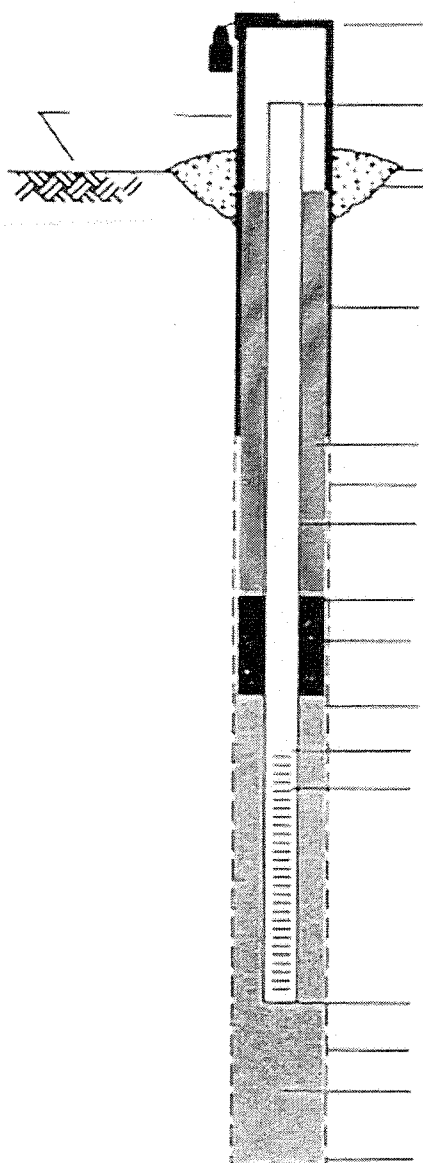
TONAWANDA, NY

METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

MONITORING WELL COMPLETION RECORD



WELL NUMBER:	CCR-3	DRILLING METHOD:	HOLLOW STEM AUGER
PROJECT:	CCR WELL - HUNTLEY PLANT	GEOLOGIST:	N/A
PROJECT NUMBER:	BD-15-143	INSTALLATION DATE(S):	9/18/2015
DRILLER:	S. WOLKIEWICZ		

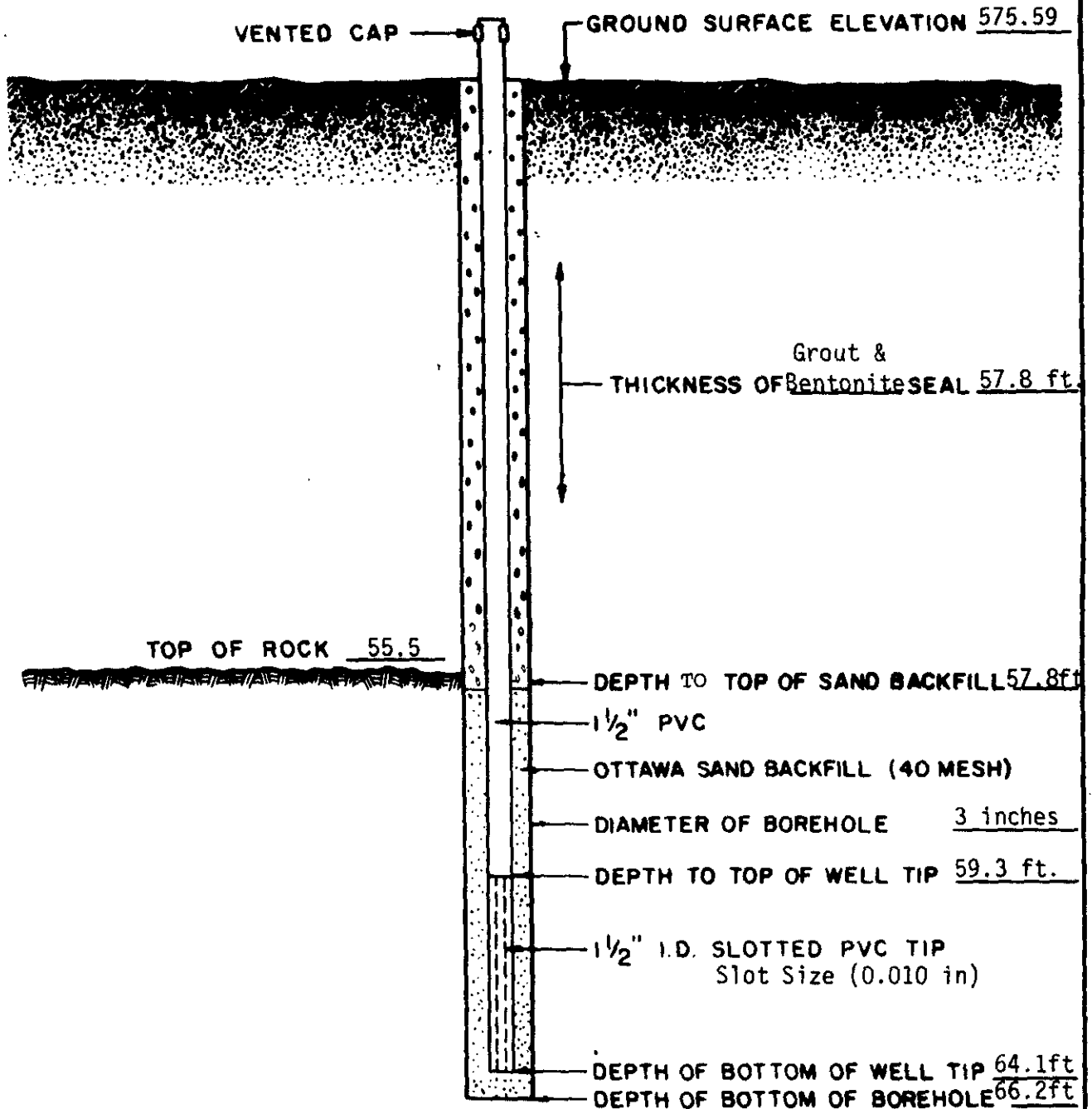


ELEVATIONS/ TOP OF SURFACE CASING:	
STICK- UP/ TOP OF SURFACE CASING:	
ELEVATION/ TOP OF RISER PIPE:	
STICK- UP/ TOP OF RISER PIPE:	
TYPE OF SURFACE SEAL:	CONCRETE
I.D. OF SURFACE CASING:	4"
TYPE OF SURFACE CASING:	STEEL
TYPE OF BACKFILL:	CEMENT / BENTONITE GROUT
BOREHOLE DIAMETER:	NOMIAL 8"
I.D. OF RISER PIPE:	2.0"
TYPE OF RISER PIPE:	SCHEDULE 40 PVC
DEPTH OF SEAL:	6.4'
TYPE OF SEAL:	BENTONITE CHIPS
DEPTH OF SAND PACK:	9.4'
DEPTH TOP OF SCREEN:	12.0'
TYPE OF SCREEN:	SCHEDULE 40 PVC
SLOT SIZE X LENGTH:	0.010" x 5'
I.D. OF SCREEN:	2.0"
TYPE OF SAND PACK:	#1 SILICA SAND AND #00 SILICA SAND
DEPTH BOTTOM OF SCREEN:	17.0'
DEPTH BOTTOM OF SAND PACK:	17.0'
TYPE OF BACKFILL BELOW OBSERVATION WELL:	#00 SILICA SAND
ELEVATION/ DEPTH OF HOLE:	18.0'

PIEZOMETER INSTALLATION REPORT

PIEZOMETER NUMBER A-2

SUMMARY OF SUBSURFACE CONDITIONS



NOTE: NOT TO SCALE

PROJECT NMPC: Huntley Steam Plant

INSPECTOR R. Laport

LOCATION Tonawanda, New York

DATE INSTALLED 9/28/83

CONTRACTOR Paratt-Wolff, Inc.



FILE NO. 5610.3

A.2—2019 Field Investigation

BORING LOG NO. CCR-7

Page 1 of 1

PROJECT: Huntley Station

CLIENT: Frontier Technical Associates Inc
Williamsville, NY

SITE: 3500 River Road
Tonawanda, NY

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 42.9678° Longitude: -78.927°	INSTALLATION DETAILS Lockable Protective Casing	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	PID (PPM)
	DEPTH							
	FILL - FLYASH , black						Auger	
		2" PVC Riser						
		Cement/Bentonite Grout	5				8-12-9-9 N=21	0.4
		Bentonite Chips					Auger	
			10				4-3-2-2 N=5	0.6
		1" Filter Sand					2-2-2-2 N=4	1.5
		10 Slot Screen	15				2-1-WOH-1 N - 1	1.3
	18.0						3-2-2-3 N=4	1.3
Boring Terminated at 18 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25 inch ID Hollow Stem Augers and 2 Inch OD Split
Barrel Sampler

Abandonment Method:
2" PVC Well installed at completion

See Exhibit A-3 for description of field
procedures.
See Appendix B for description of laboratory
procedures and additional data (if any).
See Appendix C for explanation of symbols and
abbreviations.

Notes:
WOH = Weight of Hammer and Rods

WATER LEVEL OBSERVATIONS

Terracon
461 Tonawanda St
Buffalo, NY

Boring Started: 05-29-2019

Drill Rig: Diedrich D-50

Project No.: BU195011

Boring Completed: 05-29-2019

Driller: J. Tojdowski

Exhibit: A-1

BORING LOG NO. CCR-8

Page 1 of 1

PROJECT: Huntley Station

CLIENT: Frontier Technical Associates Inc
Williamsville, NY

SITE: 3500 River Road
Tonawanda, NY

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 42.9669° Longitude: -78.9261°	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	PID (PPM)
DEPTH		Lockable Protective Casing						
	FILL - SANDY SILT , gray and black, saturated						Auger	
		2" PVC Riser						
		Cement/Bentonite Grout	5				1-1-WOH/1.0' N = 1	0.6
		Bentonite Chips					Auger	
8.0	FILL - FLYASH , black, saturated							
			10				WOH-2-1-1 N = 3	1.1
							2-1-2-1 N=3	1.3
		"0" Filter Sand					WOH/1.5' - 1 N = WOH	0.1
		10 Slot Screen	15					
16.0	Boring Terminated at 16 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25 inch ID Hollow Stem Augers and 2 Inch OD Split
Barrel Sampler

Abandonment Method:
2" PVC Well installed at completion

See Exhibit A-3 for description of field
procedures.
See Appendix B for description of laboratory
procedures and additional data (if any).
See Appendix C for explanation of symbols and
abbreviations.

Notes:
WOH = Weight of Hammer and Rods

WATER LEVEL OBSERVATIONS

Terracon
461 Tonawanda St
Buffalo, NY

Boring Started: 05-29-2019

Drill Rig: Diedrich D-50

Project No.: BU195011

Boring Completed: 05-29-2019

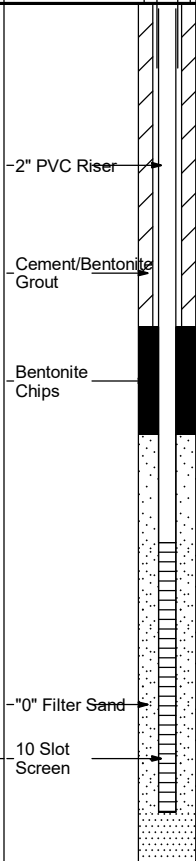
Driller: J. Tojdowski

Exhibit: A-2

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL BU195011 HUNTLEY STATION.GPJ TERRACON DATATEMPLATE.GDT 8/12/19

Page 1 of 1

CLIENT: Frontier Technical Associates Inc
Williamsville, NY

LOCATION See Exhibit A-2		INSTALLATION DETAILS		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	PID (PPM)
GRAPHIC LOG									
	Latitude: 42.966° Longitude: -78.927°		Lockable Protective Casing						
DEPTH									
	FILL - FLYASH WITH SAND , trace brick, trace concrete, black and gray saturated								
14.0				5				Auger	
							12	2-2-4-2 N=6	1.6
								Auger	
				10			13	2-1-4-11 N=5	1.4
							24	10-7-8-7 N=15	1.8
16.0	POORLY GRADED SAND (SP) , trace silt, trace brick fragments, fine grained, brown, (Possible former shoreline - native soils) Boring Terminated at 16 Feet			15			2	3-4-4-2 N=8	0

Hammer Type: Automatic

Notes:

Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL BU195011 HUNTLEY STATION.GPJ TERRACON DATATEMPLATE.GDT 6/12/19

BORING LOG NO. CCR-10

Page 1 of 1

PROJECT: Huntley Station

CLIENT: Frontier Technical Associates Inc
Williamsville, NY

SITE: 3500 River Road
Tonawanda, NY

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 42.9666° Longitude: -78.9275°	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	PID (PPM)
DEPTH		Lockable Protective Casing						
	FILL - SILTY SAND , trace brick, trace coal fragments, trace concrete, black						Auger	
8.0	FILL - FLYASH , black	2" PVC Riser Cement/Bentonite Grout Bentonite Chips	5		12		3-11-19-9 N=30	0.6
14.0	SILTY SAND (SM) , trace organic matter, gray with black	10 Slot Screen	10		0		9-9-6-13 N=15	1.5
16.0	Boring Terminated at 16 Feet		15		19		8-3-3-3 N=6	
							2-3-3-3 N=6	0.7

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25 inch ID Hollow Stem Augers and 2 Inch OD Split
Barrel Sampler

Abandonment Method:
2" PVC Well installed at completion

See Exhibit A-3 for description of field
procedures.
See Appendix B for description of laboratory
procedures and additional data (if any).
See Appendix C for explanation of symbols and
abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
461 Tonawanda St
Buffalo, NY

Boring Started: 05-30-2019

Drill Rig: Diedrich D-50

Project No.: BU195011

Boring Completed: 05-30-2019

Driller: J. Tojdowski

Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL BU195011 HUNTLEY STATION.GPJ TERRACON DATATEMPLATE.GDT 8/12/19

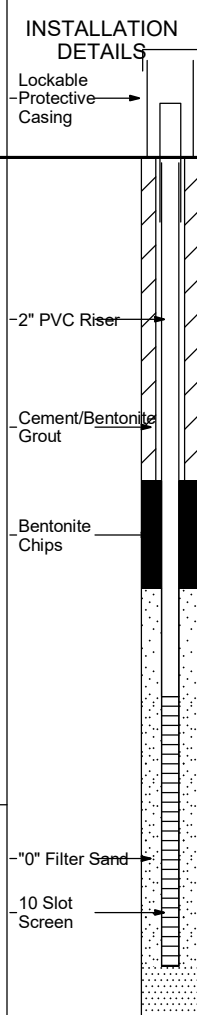
BORING LOG NO. CCR-11

Page 1 of 1

PROJECT: Huntley Station

CLIENT: Frontier Technical Associates Inc
Williamsville, NY

SITE: 3500 River Road
Tonawanda, NY

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 42.9656° Longitude: -78.9263°	INSTALLATION DETAILS Lockable Protective Casing	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	PID (PPM)
	DEPTH							
	FILL - SILTY SAND , trace concrete, trace brick, trace coal fragments, brown and black						AUGER	
			5		20		5-8-18-7 N=26	2.6
	SILTY SAND (SM) , trace organic matter, fine grained, brown, saturated		10		0		6-5-3-3 N=8	
			15		16		6-5-3-3 N=8	0.2
							3-2-1-2 N=3	0.5
	Boring Terminated at 16 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25 inch ID Hollow Stem Augers and 2 Inch OD Split
Barrel Sampler

Abandonment Method:
2" PVC Well installed at completion

See Exhibit A-3 for description of field
procedures.
See Appendix B for description of laboratory
procedures and additional data (if any).
See Appendix C for explanation of symbols and
abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
461 Tonawanda St
Buffalo, NY

Boring Started: 05-30-2019

Drill Rig: Diedrich D-50

Project No.: BU195011

Boring Completed: 05-30-2019

Driller: J. Tojdowski

Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL BU195011 HUNTLEY STATION.GPJ TERRACON.DATATEMPLATE.GDT 8/12/19

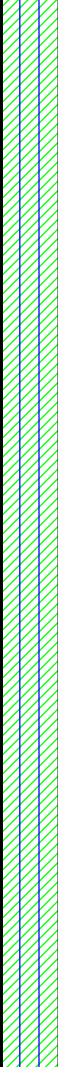
BORING LOG NO. CCR-12

Page 1 of 1

PROJECT: Huntley Station

CLIENT: Frontier Technical Associates Inc
Williamsville, NY

SITE: 3500 River Road
Tonawanda, NY

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 42.9667° Longitude: -78.9244°	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	PID (PPM)
	DEPTH							
	SILTY CLAY , trace sand, red brown and black, medium stiff to stiff						AUGER	
			5					
					X	12	4-3-4-6 N=7	0.7
							AUGER	
			10		X	6	8-3-4-5 N=7	1.9
					X	7	5-5-6-6 N=11	1.5
			15		X	24	3-4-6-7 N=10	3.7
					X	24	7-7-8-8 N=15	1.9
					X	24	2-3-4-6 N=7	5.1
	20.0		20					
	Boring Terminated at 20 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25 inch ID Hollow Stem Augers and 2 Inch OD Split
Barrel Sampler

Abandonment Method:
Boring backfilled with bentonite upon completion.

See Exhibit A-3 for description of field
procedures.
See Appendix B for description of laboratory
procedures and additional data (if any).
See Appendix C for explanation of symbols and
abbreviations.

Notes:
No Monitoring Well installed at completion of drilling.

WATER LEVEL OBSERVATIONS

Terracon
461 Tonawanda St
Buffalo, NY

Boring Started: 05-31-2019

Drill Rig: Diedrich D-50

Project No.: BU195011

Boring Completed: 05-31-2019

Driller: J. Tojdowski

Exhibit: A-6

BORING LOG NO. CCR-13

Page 1 of 1

PROJECT: Huntley Station

CLIENT: Frontier Technical Associates Inc
Williamsville, NY

SITE: 3500 River Road
Tonawanda, NY

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 42.9685° Longitude: -78.926°	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	PID (PPM)
DEPTH								
	FILL - SILTY SAND WITH FLYASH , trace brick, trace concrete, black and gray		5				AUGER	
						15	15-18-11-12 N=29	0
	FILL - SILTY CLAY , trace sand, trace brick, trace concrete, red brown						AUGER	
			10			15	3-4-5-5 N=9	0.1
	SILTY CLAY (CL-ML) , trace sand, red brown, medium stiff					20	5-5-5-6 N=10	0.6
			15				AUGER	
						23	3-2-5-6 N=7	0.3
	Boring Terminated at 20 Feet		20					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25 inch ID Hollow Stem Augers and 2 Inch OD Split
Barrel Sampler

Abandonment Method:
Boring backfilled with bentonite upon completion.

See Exhibit A-3 for description of field
procedures.
See Appendix B for description of laboratory
procedures and additional data (if any).
See Appendix C for explanation of symbols and
abbreviations.

Notes:
No Monitoring Well installed at completion of sampling

WATER LEVEL OBSERVATIONS

Terracon
461 Tonawanda St
Buffalo, NY

Boring Started: 05-31-2019

Drill Rig: Diedrich D-50

Project No.: BU195011

Boring Completed: 05-31-2019

Driller: J. Tojdowski

Exhibit: A-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL BU195011 HUNTLEY STATION.GPJ TERRACON DATATEMPLATE.GDT 8/12/19

Appendix B

State Notification



NRG Huntley Power, LLC
3500 River Road
Tonawanda, NY 14150

January 2019

Mr. David Vitale
New York State Department of Environmental Conservation
Division of Materials Management Director
625 Broadway
Albany, NY 12233-7250

RE: CCR Rule Notice

Dear Mr. Vitale:

Pursuant to the EPA's CCR Rule and sections 40 CFR Parts §257.105 - §257.107, Huntley Power LLC is notifying the New York State Department of Environmental Conservation per the Recordkeeping, Notification and Internet Requirements regarding the following operations for the Huntley Power LLC Generating Station.

In accordance with the requirements of Title 40 CFR §257.95, the station commenced and established an Assessment Monitoring Program in 2018 for the CCR impoundment and the CCR landfill. Based on the results, the facility has determined one or more SSL's (one) above the corresponding groundwater protection standard has occurred around the CCR impoundment. Notice of this determination is required to be entered into the facility operating record per §257.105(h)(8), noticed to the State Director per §257.106(h)(6) and posted to the publicly accessible website per §257.107(h)(6).

Additionally, this determination carries obligations to characterize the nature and extent of the SSL impacts per §257.95(g)(1)(i-iv), and to conduct an Assessment of Corrective Measures per §257.95(g)(3)(i) and §257.96(a) which will be initiated as required.

Information as required has or will be provided to public website <http://www.nrg.com/legal/coal-combustion-residuals/> within the timelines determined by the rule.

Should you require additional information, please contact George Streit at (716) 200-2797 or George.Streit@NRG.com.

Sincerely,

A handwritten signature in black ink, appearing to read "George Streit", written over a circular stamp or seal.

George T. Streit
Environmental Coordinator

cc: Peter Grasso, P.E., 270 Michigan Ave., Buffalo, NY 14203

Appendix C

ACM Extension

ATTORNEY-CLIENT PRIVILEGE

CCR ASSESSMENT OF CORRECTIVE MEASURES
Huntley Generating Station

April 2, 2019

George Streit
Huntley Power LLC
3500 River Road
Tonawanda, NY 14150

VIA E-MAIL

**Re: CCR Assessment of Corrective Measures Time Extension Request
Huntley Generating Station South Settling Pond
Tonawanda, New York**

Dear Mr. Streit,

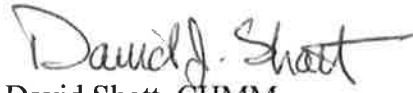
As you are aware, Title 40 Code of Federal Regulations (CFR) Part 257 Subpart D addresses the management of coal combustion residuals (CCR) in landfills and surface impoundments. As an acknowledged surface impoundment formerly used for the management of CCR materials, the South Settling Pond (Pond) at the Huntley Generating Station is subject to the provisions of the CCR Rule. On January 2, 2019, a statistical evaluation was completed that identified an arsenic concentration in a CCR monitoring well (Well CCR-2) at a statistically significant level (SSL) above its corresponding site-specific groundwater protection standard. This determination has triggered an Assessment of Corrective Measures which will commence on April 2, 2019, per §257.95(g)(3)(i) and §257.96(a).

In conjunction with the Assessment of Corrective Measures, Huntley Power LLC is evaluating various options including alignment with the voluntary efforts associated with the Station's recent entry into the New York State's Brownfield Cleanup Program (BCP). Huntley entered into a BCP agreement with the New York State Department of Environmental Conservation on February 22, 2019. The boundary limits of the BCP investigation area encompass the Station's south parcel, which also includes the South Settling Pond.

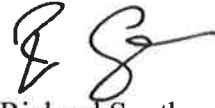
Based on the current status of the South Settling Pond CCR characterization activities and the coordinated planning for the BCP, a 60-day extension of the Assessment of Corrective Measures due date is being applied in accordance with provisions under Section 257.96(a) of the CCR Rule. Accordingly, the Assessment of Corrective Measures will be completed by August 30, 2019.

APTIM appreciates the continued opportunity for providing our technical services to Huntley Power LLC on this project.

Sincerely,



David Shott, CHMM
APTIM



Richard Southorn, P.E., P.G.
APTIM

cc: David Bacher, NRG
Tony Shea, NRG

CERTIFICATION

In accordance with Section 257.96(a) of the CCR Rule, I hereby certify based on a review of the information contained within this time extension request dated April 2, 2019, that the information contained is accurate to the best of my knowledge.

Certified by:

Richard Southorn, P.E., P.G.
New York Professional Engineer Registration No.: 97551
APTIM

Signature:



Date:

APRIL 2, 2019

Seal:



Appendix D

Laboratory Report for Arsenic in Soils



FRONTIER TECHNICAL ASSOCIATES, INC.

8675 Main Street, Williamsville, New York 14221, (716) 634-2293

Environmental Monitoring and Consulting

August 6, 2019

Mr. George Streit, P.E.
NRG Huntley Power, LLC
3500 River Road
C.R. Huntley Station
Tonawanda, NY 14150

Re: Arsenic Analysis of Soil Boring Samples

Dear Mr. Streit:

At NRG's request, some of the saved soil samples from the CCR investigation at the Huntley Station were analyzed for total arsenic and leachable arsenic. The results of this testing are summarized below:

Summary of results of Arsenic Testing of Soils at NRG Huntley Station			
Boring/Well Location	Depth Below Grade (ft)	Total Arsenic Concentration (ug/g)	SPLP Arsenic (mg/l)
CCR-7	5' to 7'	< 0.280	< 0.050
CCR-8	5' to 7'	56.0	0.168
CCR-8	10' to 12'	58.6	< 0.050
CCR-9	5' to 7'	19.0	< 0.050
CCR-10	5' to 7'	16.9	< 0.050
CCR-10	10' to 12'	< 0.308	< 0.050
CCR-11	5' to 7'	8.42	< 0.050
CCR-12	5' to 7'	< 0.310	< 0.050
CCR-13	5' to 7'	79.2	< 0.050

The laboratory reports are attached. If you have any questions please do not hesitate to call me. We appreciate the opportunity to be of service.

Sincerely,

David M. Harty, P.E., BCEE
President



Experience is the solution

314 North Pearl Street ♦ Albany, New York 12207
(800) 848-4983 ♦ (518) 434-4546 ♦ Fax (518) 434-0891

August 05, 2019

Dave Harty
Frontier Technical Associates
8675 Main Street
Williamsville, NY 14221
TEL: (716) 634-2293

Work Order No: 190726042

RE: Analysis
HUN ST CCR

Dear Dave Harty:

Adirondack Environmental Services, Inc received 7 samples on 7/26/2019 for the analyses presented in the following report.

Please see case narrative for specifics on analysis.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Tara Daniels
Laboratory Director

ELAP#: 10709

Adirondack Environmental Services, Inc

CASE NARRATIVE

CLIENT: Frontier Technical Associates

Date: 05-Aug-19

Project: Analysis

Lab Order: 190726042

Sample containers were not supplied by Adirondack Environmental Services.

Definitions - RL: Reporting Limit DF: Dilution factor

Qualifiers:	ND : Not Detected at reporting limit	C: CCV below acceptable Limits
	J: Analyte detected below quantitation limit	C+: CCV above acceptable Limits
	B: Analyte detected in Blank	S: LCS Spike recovery is below acceptable limits
	X : Exceeds maximum contamination limit	S+: LCS Spike recovery is above acceptable limits
	H: Hold time exceeded	Z: Duplication outside acceptable limits
	N: Matrix Spike below acceptable limits	T : Tentatively Identified Compound-Estimated
	N+: Matrix Spike is above acceptable limits	E :Above quantitation range-Estimated

Note : All Results are reported as wet weight unless noted

The results relate only to the items tested. Information supplied by the client is assumed to be correct.

Adirondack Environmental Services, Inc

Date: 05-Aug-19

CLIENT: Frontier Technical Associates
Project: Analysis
HUN ST CCR

LabWork Order: 190726042
PO#:

Lab SampleID: 190726042-001**Collection Date:** 5/29/2019**Client Sample ID:** CCR-7 5-7**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 7/29/2019)						Analyst: WB
Arsenic	ND	0.280		µg/g-dry	1	8/1/2019 4:43:45 PM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 7/26/2019)						Analyst: WB
Arsenic-SPLP	ND	0.050		mg/L	1	7/30/2019 12:14:41 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	11.9	0.1	H	wt%	1	7/29/2019

Lab SampleID: 190726042-002**Collection Date:** 5/29/2019**Client Sample ID:** CCR-8 5-7**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 7/29/2019)						Analyst: WB
Arsenic	56.0	0.370		µg/g-dry	1	8/1/2019 4:52:23 PM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 7/26/2019)						Analyst: WB
Arsenic-SPLP	0.168	0.050		mg/L	1	7/30/2019 12:22:06 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	32.3	0.1	H	wt%	1	7/29/2019

Adirondack Environmental Services, Inc

Date: 05-Aug-19

CLIENT: Frontier Technical Associates
Project: Analysis
HUN ST CCR

LabWork Order: 190726042
PO#:

Lab SampleID: 190726042-003**Collection Date:** 5/30/2019**Client Sample ID:** CCR-9 5-7**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 7/29/2019)						Analyst: WB
Arsenic	19.0	0.330		µg/g-dry	1	8/1/2019 5:01:03 PM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 7/26/2019)						Analyst: WB
Arsenic-SPLP	ND	0.050		mg/L	1	7/30/2019 12:29:31 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	24.4	0.1	H	wt%	1	7/29/2019

Lab SampleID: 190726042-004**Collection Date:** 5/30/2019**Client Sample ID:** CCR-10 5-7**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 7/29/2019)						Analyst: WB
Arsenic	16.9	0.280		µg/g-dry	1	8/1/2019 5:09:35 PM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 7/26/2019)						Analyst: WB
Arsenic-SPLP	ND	0.050		mg/L	1	7/30/2019 12:36:54 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	10.6	0.1	H	wt%	1	7/29/2019

Adirondack Environmental Services, Inc

Date: 05-Aug-19

CLIENT: Frontier Technical Associates
Project: Analysis
HUN ST CCR

LabWork Order: 190726042
PO#:

Lab SampleID: 190726042-005**Collection Date:** 5/30/2019**Client Sample ID:** CCR-11 5-7**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 7/29/2019)						Analyst: WB
Arsenic	8.42	0.300		µg/g-dry	1	8/1/2019 5:24:45 PM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 7/26/2019)						Analyst: WB
Arsenic-SPLP	ND	0.050		mg/L	1	7/30/2019 12:50:53 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	17.8	0.1	H	wt%	1	7/29/2019

Lab SampleID: 190726042-006**Collection Date:** 5/31/2019**Client Sample ID:** CCR-12 5-7**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 7/29/2019)						Analyst: WB
Arsenic	ND	0.310		µg/g-dry	1	8/1/2019 5:33:18 PM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 7/26/2019)						Analyst: WB
Arsenic-SPLP	ND	0.050		mg/L	1	7/30/2019 12:58:19 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	19.2	0.1	H	wt%	1	7/29/2019

Adirondack Environmental Services, Inc

Date: 05-Aug-19

CLIENT: Frontier Technical Associates
Project: Analysis
HUN ST CCR

LabWork Order: 190726042
PO#:

Lab SampleID: 190726042-007**Collection Date:** 5/31/2019**Client Sample ID:** CCR-13 5-7**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 7/29/2019)						Analyst: WB
Arsenic	79.2	0.300		µg/g-dry	1	8/1/2019 5:41:48 PM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 7/26/2019)						Analyst: WB
Arsenic-SPLP	ND	0.050		mg/L	1	7/30/2019 1:05:44 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	17.9	0.1	H	wt%	1	7/29/2019



314 North Pearl Street
Albany, New York 12207
518-434-4546/434-0891 FAX

CHAIN OF CUSTODY RECORD

AES Work Order #

190726042

Experience is the solution

A full service analytical research laboratory offering solutions to environmental concerns

Client Name: Frontier Technical Associates, Inc.		Address: 8675 Main Street, Williamsville, NY 14221						
Send Report To: David Harty		Project Name (Location) HUN ST CCR			Samplers: (Names) David Harty			
Client Phone No: 716-634-2293		Client Email: david.harty@frontiertech.com		PO Number:		Samplers: (Signature) [Signature]		
AES Sample Number	Client Sample Identification & Location	Date Sampled	Time A=a.m. P=p.m.	Sample Type			Number of Cont's	Analysis Required
				Matrix	Comp	Grab		
001	CCR-7 5-7	5/29/19	A	Soil	X	1	Total Arsenic	
			P					
002	CCR-8 5-7	5/29/19	A	1	X	1	SPLP-Arsenic	
			P					
003	CCR-9 5-7	5/30/19	A	1	X	1		
			P					
004	CCR-10 5-7	5/30/19	A	1	X	1		
			P					
005	CCR-11 5-7	5/30/19	A	1	X	1		
			P					
006	CCR-12 5-7	5/31/19	A	1	X	1		
			P					
007	CCR-13 5-7	5/31/19	A	1	X	1		
			P					
			A					
			P					
			A					
			P					
			A					
			P					
			A					
			P					
			A					
			P					
			A					
			P					

Shipment Arrived Via: ☒ FedEx ☐ UPS ☐ Client ☐ AES ☐ Other: _____		CC Report To / Special Instructions/Remarks:	
Turnaround Time Request: ☐ 1 Day ☐ 3 Day ☐ Normal ☐ 2 Day ☐ 5 Day ☒ 2 weeks Note: Samples received after 3:30 pm are considered next business day			
Relinquished by: (Signature) [Signature]		Received by: (Signature) TO Fed Ex	Date/Time 7/25/19 3:30pm
Relinquished by: (Signature)		Received by: (Signature)	Date/Time
Relinquished by: (Signature)		Received for Laboratory by: [Signature]	Date/Time 7/26/19 10:44am

TEMPERATURE Ambient or Chilled: Notes: 4°C		AES Bottles Y ☒ N ☒	PROPERLY PRESERVED (Y) ☒ N ☐	RECEIVED WITHIN HOLDING TIMES (Y) ☒ N ☐
--	--	---	--	---

WHITE - Lab Copy

YELLOW - Sampler Copy

Adirondack Environmental Service



190726042



Experience is the solution

314 North Pearl Street ♦ Albany, New York 12207
(800) 848-4983 ♦ (518) 434-4546 ♦ Fax (518) 434-0891

August 05, 2019

Dave Harty
Frontier Technical Associates
8675 Main Street
Williamsville, NY 14221
TEL: (716) 634-2293

Work Order No: 190731014

RE: Analysis
HUN ST CCR

Dear Dave Harty:

Adirondack Environmental Services, Inc received 2 samples on 7/31/2019 for the analyses presented in the following report.

Please see case narrative for specifics on analysis.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Tara Daniels
Laboratory Director

ELAP#: 10709

Adirondack Environmental Services, Inc**CASE NARRATIVE****CLIENT:** Frontier Technical Associates**Date:** 05-Aug-19**Project:** Analysis**Lab Order:** 190731014

Sample containers were not supplied by Adirondack Environmental Services.

Definitions - RL: Reporting Limit DF: Dilution factor

Qualifiers:	ND : Not Detected at reporting limit	C: CCV below acceptable Limits
	J: Analyte detected below quantitation limit	C+: CCV above acceptable Limits
	B: Analyte detected in Blank	S: LCS Spike recovery is below acceptable limits
	X : Exceeds maximum contamination limit	S+: LCS Spike recovery is above acceptable limits
	H: Hold time exceeded	Z: Duplication outside acceptable limits
	N: Matrix Spike below acceptable limits	T : Tentatively Identified Compound-Estimated
	N+: Matrix Spike is above acceptable limits	E :Above quantitation range-Estimated

Note : All Results are reported as wet weight unless noted

The results relate only to the items tested. Information supplied by the client is assumed to be correct.

Adirondack Environmental Services, Inc

Date: 05-Aug-19

CLIENT: Frontier Technical Associates
Project: Analysis
HUN ST CCR

LabWork Order: 190731014
PO#:

Lab SampleID: 190731014-001**Collection Date:** 5/29/2019**Client Sample ID:** CCR-8 10-12**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 8/1/2019)						Analyst: AVB
Arsenic	58.6	0.376		µg/g-dry	1	8/2/2019 10:30:34 AM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 8/1/2019)						Analyst: AVB
Arsenic-SPLP	ND	0.050		mg/L	1	8/2/2019 12:37:50 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	33.5	0.1	H	wt%	1	8/2/2019

Lab SampleID: 190731014-002**Collection Date:** 5/30/2019**Client Sample ID:** CCR-10 10-12**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						
(Prep: SW3050B - 8/1/2019)						Analyst: AVB
Arsenic	ND	0.308		µg/g-dry	1	8/2/2019 10:38:59 AM
SPLP METALS - SW1312/6010C						
(Prep: SW1312 - 7/31/2019)						Analyst: WB
Arsenic-SPLP	ND	0.050		mg/L	1	8/1/2019 2:48:58 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						
						Analyst: TSZ
Percent Moisture	18.8	0.1	H	wt%	1	8/2/2019



CHAIN OF CUSTODY RECORD

AES Work Order #

WORK ORDER #
190731019

A full service analytical research laboratory offering solutions to environmental concerns

Shipment Arrived Via: FedEx UPS Client AES Other: _____		CC Report To / Special Instructions/Remarks:	
Turnaround Time Request: ☐ 1 Day ☐ 3 Day ☒ Normal ☐ 2 Day ☐ 5 Day <i>Note: Samples received after 3:30 pm are considered next business day</i>			
Relinquished by: (Signature) 		Received by: (Signature) To Fed Ex	
Relinquished by: (Signature)		Received by: (Signature)	
Relinquished by: (Signature)		Received for Laboratory by: Kraz	
		Date/Time 7/30/19 4:30	
		Date/Time 7/30/19 1000	

TEMPERATURE		AES Bottles		PROPERLY PRESERVED		RECEIVED WITHIN HOLDING TIMES	
Ambient or <u>Chilled</u>		Y	N	<u>Y</u> N		<u>Y</u> N	
Notes: <u>13</u>		☒	☐	Notes: _____		Notes: _____	

WHITE - Lab Copy

YELLOW - Sampler Copy

Adirondack Environmental Service



190731014

Appendix E

Laboratory Report for June 2019 Groundwater Sampling



FRONTIER TECHNICAL ASSOCIATES, INC.

8675 Main Street, Williamsville, New York 14221, (716) 634-2293

Environmental Monitoring and Consulting

July 23, 2019

ET-1071

Mr. Gregory M. Brown, Esq.
BROWN DUKE & FOGEL, P.C.
100 Madison Street, AXA Tower 1, Ste. 1820
Syracuse, New York 13202

RE: Quarterly Sampling and Analysis Report
Huntley Plant – South Ash Pond Including New Wells
June 2019, FTA Report CCR-1071-19-002a
HUN ST CCR 2a QTR 2019

Dear Mr. Brown:

Enclosed are three copies of our report entitled "Sampling and Analysis –Huntley Plant – South Ash Pond, June 2019 ", dated July 23, 2019. The wells were sampled June 21, 2019. This report is for the CCR monitoring only. This report is a summary of the sampling, field observations and analytical data. Detailed interpretation of the results will be done comprehensively as part of the CCR submissions.

Analyses were performed using EPA approved methods by NYSDOH-ELAP laboratories. The monitoring parameters were specified by APTIM.

We appreciate the opportunity to be of service.

Sincerely,

David M. Harty

David M. Harty, P.E., BCEE
President

DMH: 19-235

Report Nos: 7095211, 190625007



FRONTIER TECHNICAL ASSOCIATES INC.

**SAMPLING AND ANALYSIS REPORT
FOR CCR PARAMETERS
HUNTLEY PLANT - SOUTH ASH POND
(June 2019)**

FTA Report CCR-1071-19-02a
HUN ST CCR 2a QTR 2019

July 23, 2019

Prepared for:

Mr. Gregory M. Brown, Esq.
BROWN DUKE & FOGEL, P.C.
100 Madison Street, AXA Tower 1, Ste. 1820
Syracuse, New York 13202

Prepared by:

Frontier Technical Associates, Inc.
8675 Main Street
Williamsville, New York 14221

The analytical test results reported herein were performed to professional standards of the NYSDOH ELAP program. The analytical data are for management use only, and except for regulatory compliance reporting, are not intended for any other purpose.



FRONTIER TECHNICAL ASSOCIATES INC.

TABLE OF CONTENTS

<u>Item</u>	<u>Page</u>
Introduction	1
Scope	1
Data Quality Objectives	4
Site History	4
Monitoring Locations	4
Groundwater Elevations	4
Sampling Personnel	4
Sampling Equipment and Containers	5
Monitoring Point Assessment	5
Well Purging	5
Laboratories	5
Field Information	5
Analytical Testing	6
QA/QC	6
Results	6
Summary	6
 <u>Appendix</u>	
Monitoring Point Assessment Forms	
Monitoring Field Forms	
Laboratory Data	
Chain-of-Custody Records	



FRONTIER TECHNICAL ASSOCIATES INC.

SAMPLING AND ANALYSIS REPORT FOR CCR PARAMETERS HUNTLEY PLANT - SOUTH ASH POND (June 2019)

INTRODUCTION

NRG Huntley Operations (NRG) owns and operates the C.R. Huntley Station in the Town of Tonawanda, New York. The station formerly produced electrical power and is located on a parcel of land at the location shown on Figure 1. The wells monitored surround the South Ash Pond and are

located at the southern end of the station.

In response to the requirements of NRG Huntley Operations, Frontier Technical Associates, Inc. has completed groundwater monitoring for the South Ash Pond wells for the June 2019 monitoring event. This analytical data and sampling report provides the information for reporting to the NYSDEC and USEPA. The monitoring includes nine wells. Five of the wells were monitored for the first time. These wells were installed and developed in May and June 2019. The locations of the monitoring wells are shown on Figure 2.

SCOPE

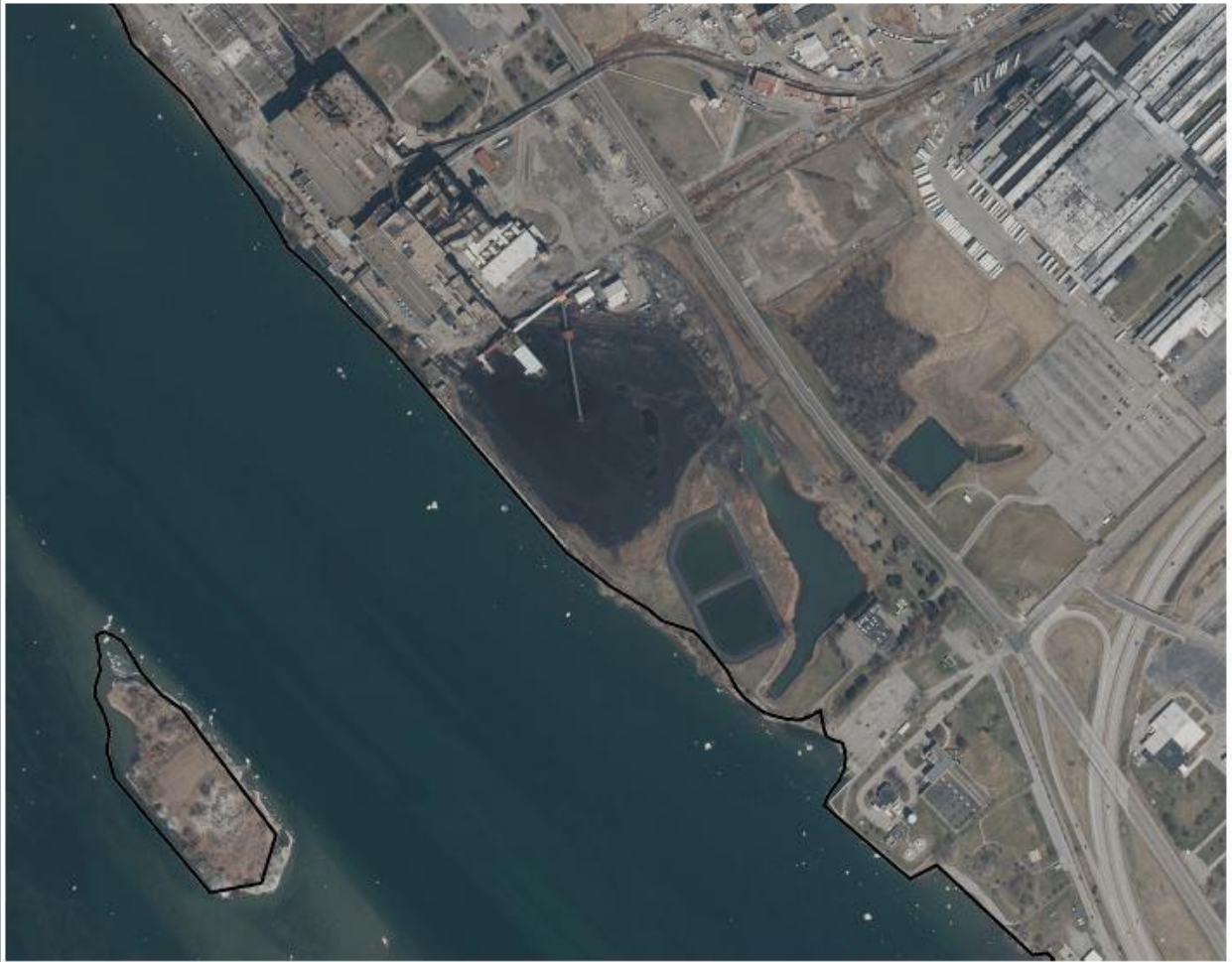
This report presents the sampling and analytical results for the June 2019 monitoring event at the NRG Huntley South Ash Pond. Groundwater sampling and field measurements were performed by Frontier Technical Associates, Inc. and laboratory measurements were performed by AES, Inc. and Pace Analytical Services, LLC. AES is a NYSDOH ELAP certified laboratory (ELAP No. 10709). Pace Analytical Services is a NYSDOH ELAP certified lab (ELAP No. 10888).

This report includes the following elements:

- Figure showing the location of the sampling points.
- Field data sheets showing the purging and sampling information and field measurements for pH, specific conductance, temperature and turbidity.



Figure 1 - General Site Plan



0 752.33 1,504.7 Feet
WGS_1984_Web_Mercator_Auxiliary_Sphere
THIS MAP IS NOT TO BE USED FOR NAVIGATION

ERIE COUNTY
DEPARTMENT OF ENVIRONMENT & PLANNING
OFFICE OF GIS

This map is a user generated static output from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.



- Analytical methods and laboratories used.
- Data summary tables.
- Quality control and quality assurance data.
- Chain-of-custody records.
- Monitoring Point Assessment Forms

DATA QUALITY OBJECTIVES

The primary data quality objectives of the monitoring program are to obtain representative samples and accurate analytical results of the groundwater surrounding the South Ash Pond at the Huntley Plant. The results are to be used in the assessment of the groundwater.

MONITORING LOCATIONS

The locations of the monitoring points are shown on Figure 2. The groundwater monitoring is sampled at the following locations:

Up-gradient Well

Well CCR-3

Downgradient Wells

Well CCR-1

Well CCR-2

Well A-2

Well CCR-7

Well CCR-8

Well CCR-9

Well CCR-10

Well CCR-11

GROUNDWATER ELEVATIONS

Groundwater elevations are measured quarterly in each of the wells. Table 1 is a summary of the groundwater elevations this quarter. Well CCR-3 is the up-gradient well.

SAMPLING PERSONNEL

Field Personnel – David Harty and Ron Blinston
Frontier Technical Associates, Inc.
8675 Main Street
Williamsville, NY 14221

SAMPLING EQUIPMENT AND CONTAINERS

The sampling equipment is constructed of inert materials. Dedicated tubing is used to obtain the samples. The tubing used is polyethylene food grade tubing. The tubing is stored in the well casing. The sample containers are polyethylene or glass as required by the analytical protocols and are prepared by the laboratory performing the analysis. The samples are preserved as required by the analytical methods immediately in the field. The samples collected are placed under chain-of-custody and a chain-of-custody record is shipped with the samples. The sample date, time of collection, analytical parameters to be tested, sampler identification and times of possession are marked on the chain-of-custody record.

MONITORING POINT ASSESSMENT

Prior to purging and sampling at each of the wells, a physical assessment of the well is made to determine if the well is suitable. These monitoring point assessment forms are presented in the Appendix. All wells were determined to be in good condition.

WELL PURGING

The wells were purged with a peristaltic pump just prior to sampling. The wells were purged to remove three standing well volumes of water or to dryness. The well purging information is recorded on the Field Observations Forms in the Appendix.

LABORATORIES

In accordance with the requirements of this project and the NYSDEC, AES, (ELAP No. 10709) a NYSDOH ELAP certified laboratory, was contracted to perform the analyses for the samples collected. The EPA and Standard Methods analytical methods used are present in the laboratory report. The radium 226 and radium 228 are determined by Pace Analytical Services (ELAP No. 10888) in Melville, New York under contract to Frontier Technical Associates.

FIELD INFORMATION

Field analyses were completed for pH, specific conductance, Eh, temperature and turbidity for each of the samples. These field data are summarized on Table 1. In general, the field parameters, pH, specific conductance, Eh, temperature and turbidity were as expected.

ANALYTICAL TESTING

The analytical parameters, results and test methods used are summarized in the Appendix. The appendices provide the following information:

- Laboratory Data Sheets
- QA/QC Documentation
- Field Data Sheets
- Chain-of-Custody Records

The complete data laboratory report for this sampling event is attached.

QA/QC

The elements of the QA/QC program for this round of sampling include the following:

- Case Narrative (See Appendix)
- Duplicate Sample
- Method Blanks

The impact these method blanks if any are discussed in the Case Narrative (See Appendix). A blind duplicate sample of CCR-1 was obtained. An acceptable duplicate analysis was obtained.

RESULTS

The analytical results are summarized in Table 1. The well samples were analyzed for the CCR select parameters. The data is to be evaluated by others as the program progresses.

SUMMARY

The well monitoring was completed in accordance with the agreed on scope of work. The data will be summarized further for use under the CCR requirements.

TABLE 1

SUMMARY OF ANALYSIS OF CCR PARAMETERS

NRG Huntley Plant

SECOND QUARTER 2019 - June 21, 2019

PARAMETER	CONCENTRATION (mg/l) unless noted				
	Well A-2 RA-2	CCR-1	CCR-2	CCR-3	Dup CCR-10
Casing Elevation (feet)	578.70	576.05	577.01	581.86	*
Depth to Water (feet)	13.38	8.56	10.05	12.73	*
Water Elevation (feet)	565.32	567.49	566.96	569.13	*
Well Length (feet)	28.6	18.06	20.16	18.88	*
Height of Water Column (feet)	15.22	9.50	10.11	6.15	*
pH (SU)	6.21	8.58	8.07	7.40	*
Specific Conductance (umhos/cm)	2,530	1,013	807	3,190	*
Temp (F)	60	58	55	55	*
Turbidity (NTU)	2.01	2.85	2.69	6.48	*
Eh (MV)	-57	-72	-138	60	*
Dissolved Oxygen	3.11	5.65	2.11	5.79	*
Chloride	77.4	164	32.7	225	45.2
Fluoride	0.49	< 0.20	0.25	< 0.20	0.41
Sulfate	1,320	95.3	95.4	737	205
Alkalinity	270	190	300	1,190	620
TDS	2,310	695	625	2,680	1,100
Arsenic	< 0.005	< 0.005	0.024	< 0.005	< 0.005
Arsenic (Dissolved)	< 0.005	< 0.005	0.019	< 0.005	< 0.005
Barium	0.026	0.141	0.052	0.060	0.120
Boron	0.408	0.289	4.04	1.08	1.19
Calcium	454	61.3	91.2	425	266
Magnesium	44.0	16.2	14.3	175	28.9
Mercury, ng/l	0.7	< 0.5	1.0	1.9	< 0.5
Potassium	7.45	6.94	21.8	16.7	11.4
Sodium	87.1	168	35.7	167	23.0
Radium 226, pCi/l	1.02	0.976	0.498	0.882	0.816
Radium 228, pCi/l	0.805	0.0501	0.00166	0.514	0.483

TABLE 1

SUMMARY OF ANALYSIS OF CCR PARAMETERS

NRG Huntley Plant

SECOND QUARTER 2019 - June 21, 2019

PARAMETER	CONCENTRATION (mg/l) unless noted				
	CCR-7	CCR-8	CCR-9	CCR-10	CCR-11
Casing Elevation (feet)	581.11	579.61	577.75	578.83	577.64
Depth to Water (feet)	12.02	10.51	10.12	11.04	9.75
Water Elevation (feet)	569.09	569.10	567.63	567.79	567.89
Well Length (feet)	17.36	17.26	17.41	17.12	17.25
Height of Water Column (feet)	5.34	6.75	7.29	6.08	7.5
pH (SU)	7.69	7.42	8.09	6.81	8.58
Specific Conductance (umhos/cm)	1,314	863	750	1,073	895
Temp (F)	52	53	56	56	54
Turbidity (NTU)	7.45	11.5	9.64	4.2	6.19
Eh (MV)	-137	-164	-161	-142	-74
Dissolved Oxygen	4.14	1.56	1.70	1.67	5.71
Chloride	29.4	16.0	64.3	46.5	82.6
Fluoride	< 0.20	< 0.20	0.46	0.42	0.24
Sulfate	354	325	12.4	193	107
Alkallinity	440	330	440	610	280
TDS	1,110	855	590	1,030	565
Arsenic	0.020	0.055	< 0.005	< 0.005	< 0.005
Arsenic (Dissolved)	0.016	0.050	< 0.005	< 0.005	< 0.005
Barium	0.080	0.132	0.106	0.119	0.116
Boron	1.38	2.41	1.62	1.20	0.658
Calcium	299	219	93.7	295	79.6
Magnesium	25.4	21.7	24.9	28.9	20.1
Mercury, ng/l	7.8	< 0.5	7.0	< 0.5	< 0.5
Potassium	11.2	10.2	16.4	11.5	9.02
Sodium	29.8	13.8	38.8	22.9	85.2
Radium 226, pCi/l	1.26	0.361	0.834	1.11	0.198
Radium 228, pCi/l	0.890	0.407	0.354	0.297	0.324



FRONTIER TECHNICAL ASSOCIATES INC.

APPENDIX

Monitoring Point Assessment Forms
Well Monitoring Field Forms
Laboratory Report
Chain-of-Custody Records



FRONTIER TECHNICAL ASSOCIATES INC.

9120 Main Street, Clarence, New York 14031 (716) 634-2293

MONITORING POINT ASSESSMENT FORM

Monitoring Point: A-2 Date: 6/21/19

Inspectors Name (Print): David Hurty

Inspector's Company: Frontier Technical Associates, Inc.

Address: 8675 Main Street, Williamsville, New York 14221

Well Locked:	☒ Yes	☐ No	☐ NA
Lock Functioning:	☒ Yes	☐ No	☐ NA
Bailer and Rope OK:	☐ Yes	☐ No	☒ NA
Tubing OK:	☒ Yes	☐ No	☐ NA
Protective Casing OK:	☒ Yes	☐ No	☐ NA
Concrete Pad in Good Condition:	☒ Yes	☐ No	☐ NA
Heaving of Well or Casing:	☐ Yes	☒ No	☐ NA
Well Sand in Purge Water:	☐ Yes	☒ No	☐ NA
Well Constricted:	☐ Yes	☒ No	☐ NA
Debris in Well:	☐ Yes	☒ No	☐ NA
Insects in Well:	☐ Yes	☒ No	☐ NA Type: _____
Wind Blown Dust inside Protective Casing:	☐ Yes	☒ No	☐ NA

Other Observations or Details on Conditions Identified Above: _____

Wobbly concrete pad

Inspector's Signature: [Signature]



FRONTIER TECHNICAL ASSOCIATES INC.

9120 Main Street, Clarence, New York 14031 (716) 634-2293

MONITORING POINT ASSESSMENT FORM

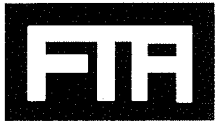
Monitoring Point: CCR-1 Date: 6/21/19

Inspectors Name (Print): David Harty
Inspector's Company: Frontier Technical Associates, Inc.
Address: 8675 Main Street, Williamsville, New York 14221

Well Locked:	☒ Yes	☐ No	☐ NA
Lock Functioning:	☒ Yes	☐ No	☐ NA
Bailer and Rope OK:	☐ Yes	☐ No	☒ NA
Tubing OK:	☒ Yes	☐ No	☐ NA
Protective Casing OK:	☒ Yes	☐ No	☐ NA
Concrete Pad in Good Condition:	☒ Yes	☐ No	☐ NA
Heaving of Well or Casing:	☐ Yes	☒ No	☐ NA
Well Sand in Purge Water:	☐ Yes	☒ No	☐ NA
Well Constricted:	☐ Yes	☒ No	☐ NA
Debris in Well:	☐ Yes	☒ No	☐ NA
Insects in Well:	☐ Yes	☒ No	☐ NA Type: _____
Wind Blown Dust inside Protective Casing:	☐ Yes	☒ No	☐ NA

Other Observations or Details on Conditions Identified Above: _____

Inspector's Signature: _____



FRONTIER TECHNICAL ASSOCIATES INC.

9120 Main Street, Clarence, New York 14031 (716) 634-2293

MONITORING POINT ASSESSMENT FORM

Monitoring Point: CCR-2 Date: 6/21/19

Inspectors Name (Print): David Harty
Inspector's Company: Frontier Technical Associates, Inc.
Address: 8675 Main Street, Williamsville, New York 14221

Well Locked:	☒ Yes	☐ No	☐ NA
Lock Functioning:	☒ Yes	☐ No	☐ NA
Bailer and Rope OK:	☐ Yes	☐ No	☒ NA
Tubing OK:	☒ Yes	☐ No	☐ NA
Protective Casing OK:	☒ Yes	☐ No	☐ NA
Concrete Pad in Good Condition:	☒ Yes	☐ No	☐ NA
Heaving of Well or Casing:	☐ Yes	☒ No	☐ NA
Well Sand in Purge Water:	☐ Yes	☒ No	☐ NA
Well Constricted:	☐ Yes	☒ No	☐ NA
Debris in Well:	☐ Yes	☒ No	☐ NA
Insects in Well:	☐ Yes	☒ No	☐ NA Type: _____
Wind Blown Dust inside Protective Casing:	☐ Yes	☒ No	☐ NA

Other Observations or Details on Conditions Identified Above: _____

Inspector's Signature: DEM/K



FRONTIER TECHNICAL ASSOCIATES INC.

9120 Main Street, Clarence, New York 14031 (716) 634-2293

MONITORING POINT ASSESSMENT FORM

Monitoring Point: CCR-3 Date: 6/21/19

Inspectors Name (Print): David Harty
Inspector's Company: Frontier Technical Associates, Inc.
Address: 8675 Main Street, Williamsville, New York 14221

Well Locked:	☒ Yes	☐ No	☐ NA
Lock Functioning:	☒ Yes	☐ No	☐ NA
Bailer and Rope OK:	☐ Yes	☐ No	☒ NA
Tubing OK:	☒ Yes	☐ No	☐ NA
Protective Casing OK:	☒ Yes	☐ No	☐ NA
Concrete Pad in Good Condition:	☒ Yes	☐ No	☐ NA
Heaving of Well or Casing:	☐ Yes	☒ No	☐ NA
Well Sand in Purge Water:	☐ Yes	☒ No	☐ NA
Well Constricted:	☐ Yes	☒ No	☐ NA
Debris in Well:	☐ Yes	☒ No	☐ NA
Insects in Well:	☐ Yes	☒ No	☐ NA
			Type: _____
Wind Blown Dust inside Protective Casing:	☐ Yes	☒ No	☐ NA

Other Observations or Details on Conditions Identified Above: _____

Inspector's Signature: DEM/K



FRONTIER TECHNICAL ASSOCIATES INC.

9120 Main Street, Clarence, New York 14031 (716) 634-2293

MONITORING POINT ASSESSMENT FORM

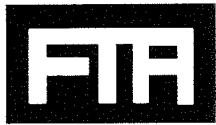
Monitoring Point: CCR-7 Date: 6/21/19

Inspectors Name (Print): David Harty
Inspector's Company: Frontier Technical Associates, Inc.
Address: 8675 Main Street, Williamsville, New York 14221

Well Locked:	☒ Yes	☐ No	☐ NA
Lock Functioning:	☒ Yes	☐ No	☐ NA
Bailer and Rope OK:	☐ Yes	☐ No	☒ NA
Tubing OK:	☒ Yes	☐ No	☐ NA
Protective Casing OK:	☒ Yes	☐ No	☐ NA
Concrete Pad in Good Condition:	☒ Yes	☐ No	☐ NA
Heaving of Well or Casing:	☐ Yes	☒ No	☐ NA
Well Sand in Purge Water:	☐ Yes	☒ No	☐ NA
Well Constricted:	☐ Yes	☒ No	☐ NA
Debris in Well:	☐ Yes	☒ No	☐ NA
Insects in Well:	☐ Yes	☒ No	☐ NA Type: _____
Wind Blown Dust inside Protective Casing:	☐ Yes	☒ No	☐ NA

Other Observations or Details on Conditions Identified Above: _____

Inspector's Signature: DEM/KZ



FRONTIER TECHNICAL ASSOCIATES INC.

9120 Main Street, Clarence, New York 14031 (716) 634-2293

MONITORING POINT ASSESSMENT FORM

Monitoring Point: CCR-8 Date: 6/21/19

Inspectors Name (Print): David Harty
Inspector's Company: Frontier Technical Associates, Inc.
Address: 8675 Main Street, Williamsville, New York 14221

Well Locked:	☒ Yes	☐ No	☐ NA
Lock Functioning:	☒ Yes	☐ No	☐ NA
Bailer and Rope OK:	☐ Yes	☐ No	☒ NA
Tubing OK:	☒ Yes	☐ No	☐ NA
Protective Casing OK:	☒ Yes	☐ No	☐ NA
Concrete Pad in Good Condition:	☒ Yes	☐ No	☐ NA
Heaving of Well or Casing:	☐ Yes	☒ No	☐ NA
Well Sand in Purge Water:	☐ Yes	☒ No	☐ NA
Well Constricted:	☐ Yes	☒ No	☐ NA
Debris in Well:	☐ Yes	☒ No	☐ NA
Insects in Well:	☐ Yes	☒ No	☐ NA Type: _____
Wind Blown Dust inside Protective Casing:	☐ Yes	☒ No	☐ NA

Other Observations or Details on Conditions Identified Above: _____

Inspector's Signature: Demetrius



FRONTIER TECHNICAL ASSOCIATES INC.

9120 Main Street, Clarence, New York 14031 (716) 634-2293

MONITORING POINT ASSESSMENT FORM

Monitoring Point: CCR-9 Date: 6/21/19

Inspectors Name (Print): David Harty
Inspector's Company: Frontier Technical Associates, Inc.
Address: 8675 Main Street, Williamsville, New York 14221

Well Locked:	☒ Yes	☐ No	☐ NA
Lock Functioning:	☒ Yes	☐ No	☐ NA
Bailer and Rope OK:	☐ Yes	☐ No	☒ NA
Tubing OK:	☒ Yes	☐ No	☐ NA
Protective Casing OK:	☒ Yes	☐ No	☐ NA
Concrete Pad in Good Condition:	☒ Yes	☐ No	☐ NA
Heaving of Well or Casing:	☐ Yes	☒ No	☐ NA
Well Sand in Purge Water:	☐ Yes	☒ No	☐ NA
Well Constricted:	☐ Yes	☒ No	☐ NA
Debris in Well:	☐ Yes	☒ No	☐ NA
Insects in Well:	☐ Yes	☒ No	☐ NA Type: _____
Wind Blown Dust inside Protective Casing:	☐ Yes	☒ No	☐ NA

Other Observations or Details on Conditions Identified Above: _____

Inspector's Signature: DEM/KZ



FRONTIER TECHNICAL ASSOCIATES INC.

9120 Main Street, Clarence, New York 14031 (716) 634-2293

MONITORING POINT ASSESSMENT FORM

Monitoring Point: CCR-10 Date: 6/21/19

Inspector's Name (Print): David Harty
Inspector's Company: Frontier Technical Associates, Inc.
Address: 8675 Main Street, Williamsville, New York 14221

Well Locked:	☒ Yes	☐ No	☐ NA
Lock Functioning:	☒ Yes	☐ No	☐ NA
Bailer and Rope OK:	☐ Yes	☐ No	☒ NA
Tubing OK:	☒ Yes	☐ No	☐ NA
Protective Casing OK:	☒ Yes	☐ No	☐ NA
Concrete Pad in Good Condition:	☒ Yes	☐ No	☐ NA
Heaving of Well or Casing:	☐ Yes	☒ No	☐ NA
Well Sand in Purge Water:	☐ Yes	☒ No	☐ NA
Well Constricted:	☐ Yes	☒ No	☐ NA
Debris in Well:	☐ Yes	☒ No	☐ NA
Insects in Well:	☐ Yes	☒ No	☐ NA Type: _____
Wind Blown Dust inside Protective Casing:	☐ Yes	☒ No	☐ NA

Other Observations or Details on Conditions Identified Above: _____

Inspector's Signature: DEM/K



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: **NRG Huntley**

Job No. **ET-1171**

Sample Point ID.: CCR-A-2

Consultant: **Frontier Technical Associates, Inc.**

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 28.60 ft.

1.5" Well = 0.092 gals/ft

Depth to Water Surface: 13.38 ft

Depth of Water Column: 15.22 ft.

Volume of Standing Water in Well: 1.41 gallons

Start of Purge: Date: 6/21/19 Time: 9:28

End of Purge: Date: 6/21/19 Time: 9:50

Total Volume Purge: 4.25 gals Well Purged Dry?: Yes ☒ No ☐ # of Volumes Purged 3

Purging Personnel: RON BLINSTON

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION

Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 9:53 Depth to Water Surface 13.45 ft.

Sample Appearance: CLEAR

Samples Preserved: Yes ☒ No ☐ Dissolved Metals Field Filtered: Yes ☒ No ☐ NA

Sampling Personnel: RON BLINSTON Signature: [Signature]

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>6.21</u>	<u>(6.23)</u>
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>2530</u>	
Temperature	UEI <u>(F-1)</u>	C or <u>F</u>	<u>59.8</u>	
Turbidity	Hach 2100P	NTU	<u>2.01</u>	
ORP	Oakton ORPtester	Mv	<u>-57</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>3.11</u>	

Weather: _____

Notes: _____

Reviewed by: Kathy Wagon



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: **NRG Huntley**

Job No. **ET-1171**

Sample Point ID.: CCR-1

Consultant: **Frontier Technical Associates, Inc.**

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 18.06 ft.

2" Well = 0.17 gals/ft

Depth to Water Surface: 8.56 ft

Depth of Water Column: 9.50 ft.

Volume of Standing Water in Well: 1.7 gallons

Start of Purge: Date: 6/21/19 Time: 12:35

End of Purge: Date: 6/21/19 Time: 12:49

Total Volume Purge: 5.1 gals Well Purged Dry?: Yes ☒ No # of Volumes Purged 3

Purging Personnel: RON BLINSTON

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION

Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 12:50 Depth to Water Surface 9.69 ft.

Sample Appearance: CLEAR

Samples Preserved: Yes No Dissolved Metals Field Filtered: Yes No NA

Sampling Personnel: RON BLINSTON Signature: [Signature]

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>8.58</u>	
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>1013</u>	
Temperature	UEI	C or F	<u>58</u>	
Turbidity	Hach 2100P	NTU	<u>2.85</u>	
ORP	Oakton ORPtester	Mv	<u>-72</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>5.65</u>	

Weather: _____

Notes: MS / MSO

Reviewed by: Kathy Wagon



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: NRG Huntley

Job No. ET-1171

Sample Point ID.: CCR-2

Consultant: Frontier Technical Associates, Inc.

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 20.16 ft.

2" Well = 0.17 gals/ft

Depth to Water Surface: 10.05 ft

Depth of Water Column: 10.11 ft.

Volume of Standing Water in Well: 1.8 gallons

Start of Purge: Date: 6/21/19 Time: 10:21

End of Purge: Date: 6/21/19 Time: 10:40

Total Volume Purge: 5.4 gals Well Purged Dry?: Yes ☒ No ☐ # of Volumes Purged 3

Purging Personnel: RON BLINSTON

Recharge Rate: ☒ Rapid ☐ Slow, ☐ Extremely Slow

SAMPLING INFORMATION

Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 10:42 Depth to Water Surface 10.15 ft.

Sample Appearance: CLEAR

Samples Preserved: ☒ Yes ☐ No Dissolved Metals Field Filtered: ☒ Yes ☐ No NA

Sampling Personnel: RON BLINSTON Signature: [Signature]

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>8.07</u>	
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>807</u>	
Temperature	UEI	C or F	<u>55</u>	
Turbidity	Hach 2100P	NTU	<u>2.69</u>	
ORP	Oakton ORPtester	Mv	<u>-138</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>2.64</u>	<u>2.11 RB</u>

Weather: _____

Notes: _____

Reviewed by: Kathy Wagon



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: NRG Huntley

Job No. ET-1171

Sample Point ID.: CCR-3

Consultant: Frontier Technical Associates, Inc.

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 18.88 ft.

2" Well = 0.17 gals/ft

Depth to Water Surface: 12.73 ft

Depth of Water Column: 6.15 ft.

Volume of Standing Water in Well: 1.1 gallons

Start of Purge: Date: 6/21/19 Time: 11:57

End of Purge: Date: 6/21/19 Time: 17:17

Total Volume Purge: 3.3 gals Well Purged Dry?: Yes No # of Volumes Purged 3

Purging Personnel: RON BLINSTON

Recharge Rate: Rapid Slow Extremely Slow

SAMPLING INFORMATION

Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 12:18 Depth to Water Surface _____ ft.

Sample Appearance: CLEAR

Samples Preserved: Yes No Dissolved Metals Field Filtered Yes No NA

Sampling Personnel: RON BLINSTON Signature: [Signature]

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>7.40</u>	
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>3190</u>	
Temperature	UEI	C or F	<u>55</u>	
Turbidity	Hach 2100P	NTU	<u>6.48</u>	
ORP	Oakton ORPtester	Mv	<u>60</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>5.79</u>	

Weather: _____

Notes: _____

Reviewed by: Kathy Wagon



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: NRG Huntley

Job No. ET-1171

Sample Point ID.: CCR-7

Consultant: Frontier Technical Associates, Inc.

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 17.36 ft.

2" Well = 0.17 gals/ft

Depth to Water Surface: 12.02 ft

Depth of Water Column: 5.34 ft.

Volume of Standing Water in Well: 0.91 gallons

Start of Purge: Date: 6/21/19 Time: 11:07

End of Purge: Date: 6/21/19 Time: 11:18

Total Volume Purge: 3 gals Well Purged Dry?: Yes ☒ No ☐ # of Volumes Purged 3

Purging Personnel: RON BLINSTON

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION

Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 11:19 Depth to Water Surface 12.02 ft.

Sample Appearance: CLEAR

Samples Preserved: Yes ☒ No ☐ Dissolved Metals Field Filtered: Yes ☒ No ☐ NA

Sampling Personnel: RON BLINSTON Signature: [Signature]

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>7.69</u>	
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>1314</u>	
Temperature	UEI	C or ☒ F	<u>52</u>	
Turbidity	Hach 2100P	NTU	<u>7.45</u>	
ORP	Oakton ORPtester	Mv	<u>-137</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>4.14</u>	

Weather: _____

Notes: _____

Reviewed by: Kathy Wegy



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: NRG Huntley

Job No. ET-1171

Sample Point ID.: CCR-8

Consultant: Frontier Technical Associates, Inc.

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 17.26 ft.

2" Well = 0.17 gals/ft

Depth to Water Surface: 10.51 ft

Depth of Water Column: 6.75 ft.

Volume of Standing Water in Well: 1.14 gallons

Start of Purge: Date: 6/21/19 Time: 11:05

End of Purge: Date: 6/21/19 Time: 11:32

Total Volume Purge: 3.5 gals Well Purged Dry?: Yes ☒ No # of Volumes Purged 3

Purging Personnel: David Hartz

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION

Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 11:32 Depth to Water Surface 10.53 ft.

Sample Appearance: Clear

Samples Preserved Yes No Dissolved Metals Field Filtered Yes No NA

Sampling Personnel: David Hartz Signature: [Signature]

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>7.42</u>	
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>863</u>	
Temperature	UEI	C or F	<u>53</u>	
Turbidity	Hach 2100P	NTU	<u>11.5</u>	
ORP	Oakton ORPtester	Mv	<u>-164</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>1.56</u>	

Weather: _____

Notes: _____

Reviewed by: Kathy Wozniak



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: **NRG Huntley**

Job No. **ET-1171**

Sample Point ID.: CCR-9

Consultant: **Frontier Technical Associates, Inc.**

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 17.41 ft.

2" Well = 0.17 gals/ft

Depth to Water Surface: 10.12 ft

Depth of Water Column: 7.29 ft.

Volume of Standing Water in Well: 1.24 gallons

Start of Purge: Date: 6/21/19 Time: 10:44

End of Purge: Date: 6/21/19 Time: 10:58

Total Volume Purge: 3.7 gals Well Purged Dry?: Yes ☒ No ☐ # of Volumes Purged 3

Purging Personnel: David Hardy

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 10:58 Depth to Water Surface 10.12 ft.

Sample Appearance: Clear

Samples Preserved: Yes ☒ No ☐ Dissolved Metals Field Filtered Yes ☒ No ☐ NA

Sampling Personnel: David Hardy Signature: [Signature]

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>8.09</u>	
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>750</u>	
Temperature	UEI	C or <u>F</u>	<u>56</u>	
Turbidity	Hach 2100P	NTU	<u>9.64</u>	
ORP	Oakton ORPtester	Mv	<u>-161</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>1.70</u>	

Weather: Sunny 60's

Notes: _____

Reviewed by: Kathy Wozniak



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: NRG Huntley

Job No. ET-1171

Sample Point ID.: CCR-10

Consultant: Frontier Technical Associates, Inc.

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 17.12 ft.

2" Well = 0.17 gals/ft

Depth to Water Surface: 11.04 ft

Depth of Water Column: 6.37 ft.

Volume of Standing Water in Well: 1.1 gallons

Start of Purge: Date: 6/21/19 Time: 9:52

End of Purge: Date: 6/21/19 Time: 10:25

Total Volume Purge: 3.5 gals Well Purged Dry?: Yes No # of Volumes Purged 3

Purging Personnel: David Hardy

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION

Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 10:25 Depth to Water Surface 11.22 ft.

Sample Appearance: Clear

Samples Preserved: Yes No Dissolved Metals Field Filtered Yes No NA

Sampling Personnel: David Hardy Signature: DTM

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>6.81 (6.81)</u>	
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>1073 (1073)</u>	
Temperature	UEI	C or <u>F</u>	<u>56</u>	
Turbidity	Hach 2100P	NTU	<u>4.2 (7.88)</u>	
ORP	Oakton ORPtester	Mv	<u>-142</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>1.67</u>	

Weather: _____

Notes: Dup

Reviewed by: Kathy Wagon



FRONTIER TECHNICAL ASSOCIATES, INC.
WELL MONITORING FIELD FORM

Site Location: NRG Huntley

Job No. ET-1171

Sample Point ID.: CCR-11

Consultant: Frontier Technical Associates, Inc.

PURGE INFORMATION

Purge Method: Peristaltic Pump

Depth to Bottom of Well: 17.25 ft.

2" Well = 0.17 gals/ft

Depth to Water Surface: 9.75 ft

Depth of Water Column: 7.50 ft.

Volume of Standing Water in Well: 1.3 gallons

Start of Purge: Date: 6/21/19 Time: 1:07

End of Purge: Date: 6/21/19 Time: 1:15

Total Volume Purge: 4 gals Well Purged Dry?: Yes ☒ No ☐ # of Volumes Purged 3

Purging Personnel: RON BLINSTON

Recharge Rate: Rapid, Slow, Extremely Slow

SAMPLING INFORMATION

Sample Method: Peristaltic Pump

Sample Date: 6/21/19 Sample Time: 1:16 Depth to Water Surface 9.80 ft.

Sample Appearance: CLEAR

Samples Preserved: ☒ Yes ☐ No Dissolved Metals Field Filtered ☒ Yes ☐ No NA

Sampling Personnel: RON BLINSTON Signature: [Signature]

FIELD MEASUREMENTS

Parameter	Meter No.	Units	Measurement	Notes
pH	Oakton 300	SU	<u>8.58</u>	
Spec. Conductance	Oakton Con 6	uMhos/cm	<u>895</u>	
Temperature	UEI	C or F	<u>54</u>	
Turbidity	Hach 2100P	NTU	<u>6.19</u>	
ORP	Oakton ORPtester	Mv	<u>-74</u>	
Dissolved Oxygen	YSI Pro DO	Mg/l	<u>5.71</u>	

Weather: _____

Notes: _____

Reviewed by: Kathy Wagy

July 15, 2019

David Harty
Frontier Technical Associates
8675 Main Street
Buffalo, NY 14221

RE: Project: PLANT N CCR 6/21
Pace Project No.: 7095211

Dear David Harty:

Enclosed are the analytical results for sample(s) received by the laboratory on June 26, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



James Murphy
james.murphy@pacelabs.com
(518)860-9724
Project Manager

Enclosures

cc: Kathy Wager, Frontier Technical Associates, Inc.



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
7095211001	CCR-1	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211002	CCR-2	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211003	CCR-3	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211004	CCR-7	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211005	CCR-8	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211006	CCR-9	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211007	CCR-10	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211008	CCR-11	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211009	DUP	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211010	EQ-1	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211011	EQ-2	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211012	SSP	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
7095211013	CCR-A-2	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-1 **Lab ID: 7095211001** Collected: 06/21/19 12:50 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.976 ± 0.863 (1.28) C:NA T:87%	pCi/L	07/12/19 10:34	13982-63-3	
Radium-228	EPA 904.0	0.0501 ± 0.356 (0.819) C:74% T:83%	pCi/L	07/08/19 12:56	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-2 **Lab ID: 7095211002** Collected: 06/21/19 10:42 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.498 ± 0.589 (0.925) C:NA T:82%	pCi/L	07/12/19 10:34	13982-63-3	
Radium-228	EPA 904.0	0.00166 ± 0.372 (0.868) C:73% T:82%	pCi/L	07/08/19 12:56	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-3 **Lab ID: 7095211003** Collected: 06/21/19 12:18 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.882 ± 0.700 (0.910) C:NA T:81%	pCi/L	07/12/19 10:34	13982-63-3	
Radium-228	EPA 904.0	0.514 ± 0.496 (1.03) C:73% T:82%	pCi/L	07/08/19 12:56	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-7 **Lab ID: 7095211004** Collected: 06/21/19 11:19 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.26 ± 0.877 (1.18) C:NA T:85%	pCi/L	07/12/19 10:34	13982-63-3	
Radium-228	EPA 904.0	0.890 ± 0.465 (0.825) C:75% T:85%	pCi/L	07/08/19 12:56	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-8 **Lab ID: 7095211005** Collected: 06/21/19 11:32 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.361 ± 0.503 (0.839) C:NA T:88%	pCi/L	07/12/19 10:48	13982-63-3	
Radium-228	EPA 904.0	0.407 ± 0.434 (0.907) C:74% T:89%	pCi/L	07/08/19 12:56	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-9 **Lab ID: 7095211006** Collected: 06/21/19 10:58 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.834 ± 0.710 (0.997) C:NA T:87%	pCi/L	07/12/19 10:48	13982-63-3	
Radium-228	EPA 904.0	0.354 ± 0.422 (0.894) C:76% T:87%	pCi/L	07/08/19 12:56	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-10 **Lab ID: 7095211007** Collected: 06/21/19 10:25 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.11 ± 1.03 (1.56) C:NA T:84%	pCi/L	07/12/19 10:48	13982-63-3	
Radium-228	EPA 904.0	0.297 ± 0.354 (0.746) C:73% T:93%	pCi/L	07/08/19 12:56	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-11 **Lab ID: 7095211008** Collected: 06/21/19 13:16 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.198 ± 0.613 (1.19) C:NA T:77%	pCi/L	07/12/19 10:48	13982-63-3	
Radium-228	EPA 904.0	0.324 ± 0.378 (0.793) C:74% T:83%	pCi/L	07/08/19 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: DUP **Lab ID: 7095211009** Collected: 06/21/19 00:00 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.816 ± 0.648 (0.842) C:NA T:86%	pCi/L	07/12/19 10:48	13982-63-3	
Radium-228	EPA 904.0	0.483 ± 0.399 (0.792) C:74% T:81%	pCi/L	07/08/19 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: EQ-1 **Lab ID: 7095211010** Collected: 06/21/19 13:57 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.508 ± 0.624 (1.02) C:NA T:87%	pCi/L	07/12/19 10:48	13982-63-3	
Radium-228	EPA 904.0	0.259 ± 0.428 (0.930) C:76% T:80%	pCi/L	07/08/19 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: EQ-2 **Lab ID: 7095211011** Collected: 06/21/19 13:48 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.819 ± 1.51 (2.20) C:NA T:32%	pCi/L	07/12/19 10:48	13982-63-3	
Radium-228	EPA 904.0	-0.233 ± 1.35 (3.21) C:77% T:20%	pCi/L	07/08/19 16:33	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: SSP **Lab ID: 7095211012** Collected: 06/21/19 13:38 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.494 ± 0.584 (0.918) C:NA T:78%	pCi/L	07/12/19 10:48	13982-63-3	
Radium-228	EPA 904.0	0.373 ± 0.449 (0.949) C:76% T:68%	pCi/L	07/08/19 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Sample: CCR-A-2 **Lab ID: 7095211013** Collected: 06/21/19 09:53 Received: 06/26/19 10:30 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.02 ± 0.839 (1.21) C:NA T:84%	pCi/L	07/12/19 11:09	13982-63-3	
Radium-228	EPA 904.0	0.805 ± 0.442 (0.798) C:77% T:87%	pCi/L	07/08/19 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

QC Batch:	349820	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	7095211001, 7095211002, 7095211003, 7095211004, 7095211005, 7095211006, 7095211007, 7095211008, 7095211009, 7095211010, 7095211011, 7095211012, 7095211013		

METHOD BLANK:	1700818	Matrix:	Water
Associated Lab Samples:	7095211001, 7095211002, 7095211003, 7095211004, 7095211005, 7095211006, 7095211007, 7095211008, 7095211009, 7095211010, 7095211011, 7095211012, 7095211013		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.369 ± 0.356 (0.729) C:84% T:80%	pCi/L	07/08/19 12:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

QC Batch:	349811	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	7095211001, 7095211002, 7095211003, 7095211004, 7095211005, 7095211006, 7095211007, 7095211008, 7095211009, 7095211010, 7095211011, 7095211012, 7095211013		

METHOD BLANK:	1700808	Matrix:	Water
Associated Lab Samples:	7095211001, 7095211002, 7095211003, 7095211004, 7095211005, 7095211006, 7095211007, 7095211008, 7095211009, 7095211010, 7095211011, 7095211012, 7095211013		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0850 ± 0.441 (0.914) C:NA T:76%	pCi/L	07/12/19 10:34	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: PLANT N CCR 6/21
Pace Project No.: 7095211

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PLANT N CCR 6/21

Pace Project No.: 7095211

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
7095211001	CCR-1	EPA 903.1	349811		
7095211002	CCR-2	EPA 903.1	349811		
7095211003	CCR-3	EPA 903.1	349811		
7095211004	CCR-7	EPA 903.1	349811		
7095211005	CCR-8	EPA 903.1	349811		
7095211006	CCR-9	EPA 903.1	349811		
7095211007	CCR-10	EPA 903.1	349811		
7095211008	CCR-11	EPA 903.1	349811		
7095211009	DUP	EPA 903.1	349811		
7095211010	EQ-1	EPA 903.1	349811		
7095211011	EQ-2	EPA 903.1	349811		
7095211012	SSP	EPA 903.1	349811		
7095211013	CCR-A-2	EPA 903.1	349811		
7095211001	CCR-1	EPA 904.0	349820		
7095211002	CCR-2	EPA 904.0	349820		
7095211003	CCR-3	EPA 904.0	349820		
7095211004	CCR-7	EPA 904.0	349820		
7095211005	CCR-8	EPA 904.0	349820		
7095211006	CCR-9	EPA 904.0	349820		
7095211007	CCR-10	EPA 904.0	349820		
7095211008	CCR-11	EPA 904.0	349820		
7095211009	DUP	EPA 904.0	349820		
7095211010	EQ-1	EPA 904.0	349820		
7095211011	EQ-2	EPA 904.0	349820		
7095211012	SSP	EPA 904.0	349820		
7095211013	CCR-A-2	EPA 904.0	349820		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

WO#: 7095211



ALL SHADES 7095211

Lab Project Manager:

3m2

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields
Billing Information:

Company: **Frontier Technical Associates**

Address: **8675 Marv Street**

Report To: **David Hardy**

Copy To:

Customer Project Name/Number: **Plant N CCR**

Phone: **766 342 2993**

Email: **David Hardy**

Collected By (print): **David Hardy**

Turnaround Date Required: **Standard**

Rush: ☐ Same Day ☐ Next Day ☐ 2 Day ☐ 3 Day ☐ 4 Day ☐ 5 Day

Sample Disposal: ☐ Dispose as appropriate ☐ Return ☐ Archive ☐ Hold:

* Matrix Codes (insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID

Matrix *

Comp / Grab

Collected (or Composite Start)

Date

Time

Composite End

Date

Time

Res

Cl

of Ctns

Wet

Blue

Dry

None

Type of Ice Used:

Packing Material Used:

Radchem sample(s) screened (<500 cpm):

Received by/Company: (Signature)

Date/Time:

Received by/Company: (Signature)

Date/Time:

Received by/Company: (Signature)

Date/Time:

Received by/Company: (Signature)

Date/Time:

Received by/Company: (Signature)

Date/Time:

Site Collection Info/Address:

State: **NY**

County/City:

Time Zone Collected:

[] PT [] MT [] CT [] ET

Compliance Monitoring?

[] Yes [] No

DW PWS ID #:

DW Location Code:

Immediately Packed on Ice:

[] Yes [] No

Field Filtered (if applicable):

[] Yes [] No

Analysis:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact Y N NA

Custody Signatures Present Y N NA

Collector Signature Present Y N NA

Bottles Intact Y N NA

Correct Bottles Y N NA

Sufficient Volume Y N NA

Vials - Headspace Acceptable Y N NA

USDA Regulated Soils Y N NA

Samples in Holding Time Y N NA

Residual Chlorine Present Y N NA

Cl Strips: Y N NA

Sample pH Acceptable Y N NA

pH Strips: Y N NA

Sulfide Present Y N NA

Lead Acetate Strips: Y N NA

LAB USE ONLY:

Lab Sample # / Comments:

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Cooler 1 Temp Upon Receipt: oC

Cooler 1 Temp Cor. Factor: oC

Cooler 1 Corrected Temp: oC

Comments:

Trip Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s):

YES / NO

Page: of

WO#: 7095211

PM: JM2 Due Date: 07/11/19
CLIENT: FTA

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

Company:

Frontier Technical Associates
8675 Main Street

Report To:

David Hardy

Copy To:

Plant N CCR

Customer Project Name/Number:

Plant N CCR

Phone:

716634 2293

Collected by (print):

David Hardy

Quote #:

Turnaround Date Required:

Standard

Sample Disposal:

Dispose as appropriate [] Return [] Archive: [] Hold:

Rush: [] Same Day [] Next Day [] 12 Day [] 3 Day [] 4 Day [] 5 Day (Expedite Charges Apply)

* Matrix Ccides (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID

EQ-2

SSP

CCR-A-2

Matrix *

WW

WW

GC

Comp / Grab

G

G

G

Collected (or Composite Start)

Date

Time

6/24/19

1:48

1:38

9:23

Res

CI

of Ctns

2

2

2

Composite End

Date

Time

Wet

Blue

Dry

None

Type of Ice Used:

Packing Material Used:

Customer Remarks / Special Conditions / Possible Hazards:

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2386088

Samples received via: FEDEX UPS Client Courier Pace Courier

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Date/Time: 6-25-19 10:05

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Received by/Company: (Signature)

Temp Blank Received: Y N NA

Therm ID#:

Cooler 1 Temp Upon Receipt: oC

Cooler 1 Therm Corr. Factor: oC

Cooler 1 Corrected Temp: oC

Comments:

Temp Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s):

YES / NO

Page: 2

of: 2

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Cooler 1 Temp Upon Receipt: oC

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Cooler 1 Temp Upon Receipt: oC

Cooler 1 Therm Corr. Factor: oC

Cooler 1 Corrected Temp: oC

Comments:

Temp Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s):

YES / NO

Page: 2

of: 2

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Cooler 1 Temp Upon Receipt: oC

Cooler 1 Therm Corr. Factor: oC

Cooler 1 Corrected Temp: oC

Comments:

Temp Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s):

YES / NO

Page: 2

of: 2

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Cooler 1 Temp Upon Receipt: oC

Cooler 1 Therm Corr. Factor: oC

Cooler 1 Corrected Temp: oC

Comments:

Temp Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s):

YES / NO

Page: 2

of: 2

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:

Cooler 1 Temp Upon Receipt: oC

Cooler 1 Therm Corr. Factor: oC

Cooler 1 Corrected Temp: oC

Comments:

Temp Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s):

YES / NO

Page: 2

of: 2

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#:



Experience is the solution

314 North Pearl Street ♦ Albany, New York 12207
(800) 848-4983 ♦ (518) 434-4546 ♦ Fax (518) 434-0891

July 17, 2019

Dave Harty
Frontier Technical Associates
8675 Main Street
Williamsville, NY 14221
TEL: (716) 634-2293

Work Order No: 190625007

RE: Plant N CCR GW

Dear Dave Harty:

Adirondack Environmental Services, Inc received 13 samples on 6/25/2019 for the analyses presented in the following report.

These samples were received outside the acceptable temperature range of 2-6 °C

Please see case narrative for specifics on analysis.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "Monica Higdon", is written over a horizontal line.

Monica Higdon
Laboratory Manager

ELAP#: 10709

Adirondack Environmental Services, Inc

CASE NARRATIVE

CLIENT: Frontier Technical Associates

Date: 17-Jul-19

Project: Plant N CCR GW

Lab Order: 190625007

Sample containers were supplied by Adirondack Environmental Services.

Definitions - RL: Reporting Limit DF: Dilution factor

Qualifiers:	ND : Not Detected at reporting limit	C: CCV below acceptable Limits
	J: Analyte detected below quantitation limit	C+: CCV above acceptable Limits
	B: Analyte detected in Blank	S: LCS Spike recovery is below acceptable limits
	X : Exceeds maximum contamination limit	S+: LCS Spike recovery is above acceptable limits
	H: Hold time exceeded	Z: Duplication outside acceptable limits
	N: Matrix Spike below acceptable limits	T : Tentatively Identified Compound-Estimated
	N+: Matrix Spike is above acceptable limits	E :Above quantitation range-Estimated

Note : All Results are reported as wet weight unless noted

The results relate only to the items tested. Information supplied by the client is assumed to be correct.

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-1
Collection Date: 6/21/2019
Lab Sample ID: 190625007-001
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	ND	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 1:44:44 PM
Barium	0.141	0.010		mg/L	1	7/3/2019 1:44:44 PM
Boron	0.289	0.050		mg/L	1	7/3/2019 1:44:44 PM
Calcium	61.3	0.050		mg/L	1	7/3/2019 1:44:44 PM
Magnesium	16.2	0.050		mg/L	1	7/3/2019 1:44:44 PM
Potassium	6.94	0.050		mg/L	1	7/3/2019 1:44:44 PM
Sodium	168	0.500		mg/L	10	7/3/2019 1:49:59 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 5:10:58 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	ND	0.20		mg/L	2	7/11/2019 3:50:02 AM
Chloride	164	10.0		mg/L	10	7/11/2019 4:09:05 AM
Sulfate	95.3	2.00		mg/L	2	7/11/2019 3:50:02 AM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	190	10		mgCaCO3/L	1	6/29/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	695	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-2
Collection Date: 6/21/2019
Lab Sample ID: 190625007-002
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E						
(Prep: 1631E - 6/25/2019)						Analyst: WB
Mercury	1.0	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4						
(Prep: - 6/25/2019)						Analyst: SM
Arsenic	0.024	0.005		mg/L	1	7/3/2019 1:55:03 PM
Barium	0.052	0.010		mg/L	1	7/3/2019 1:55:03 PM
Boron	4.04	0.050		mg/L	1	7/3/2019 1:55:03 PM
Calcium	91.2	0.050		mg/L	1	7/3/2019 1:55:03 PM
Magnesium	14.3	0.050		mg/L	1	7/3/2019 1:55:03 PM
Potassium	21.8	0.050		mg/L	1	7/3/2019 1:55:03 PM
Sodium	35.7	0.050		mg/L	1	7/3/2019 1:55:03 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4						
(Prep: - 6/25/2019)						Analyst: SM
Arsenic, Dissolved	0.019	0.005		mg/L	1	7/3/2019 5:32:41 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1						
						Analyst: CS
Fluoride	0.25	0.20		mg/L	2	7/11/2019 4:28:06 AM
Chloride	32.7	2.00		mg/L	2	7/11/2019 4:28:06 AM
Sulfate	95.4	2.00		mg/L	2	7/11/2019 4:28:06 AM
ALKALINITY TO PH 4.5 -SM 2320B-2011						
						Analyst: DAA
Alkalinity, Total (As CaCO3)	300	10		mgCaCO3/L	1	6/29/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011						
						Analyst: CC
TDS (Residue, Filterable)	625	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-3
Collection Date: 6/21/2019
Lab Sample ID: 190625007-003
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	1.9	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 2:20:49 PM
Barium	0.060	0.010		mg/L	1	7/3/2019 2:20:49 PM
Boron	1.08	0.050		mg/L	1	7/3/2019 2:20:49 PM
Calcium	425	0.500		mg/L	10	7/3/2019 2:26:04 PM
Magnesium	175	0.500		mg/L	10	7/3/2019 2:26:04 PM
Potassium	16.7	0.050		mg/L	1	7/3/2019 2:20:49 PM
Sodium	167	0.500		mg/L	10	7/3/2019 2:26:04 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 5:48:16 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	ND	0.20		mg/L	2	7/11/2019 5:25:13 AM
Chloride	225	20.0		mg/L	20	7/11/2019 7:03:40 AM
Sulfate	737	20.0		mg/L	20	7/11/2019 7:03:40 AM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	1190	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	2680	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-7
Collection Date: 6/21/2019
Lab Sample ID: 190625007-004
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	7.8	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	0.020	0.005		mg/L	1	7/3/2019 2:31:11 PM
Barium	0.080	0.010		mg/L	1	7/3/2019 2:31:11 PM
Boron	1.38	0.050		mg/L	1	7/3/2019 2:31:11 PM
Calcium	299	0.500		mg/L	10	7/3/2019 2:36:21 PM
Magnesium	25.4	0.050		mg/L	1	7/3/2019 2:31:11 PM
Potassium	11.2	0.050		mg/L	1	7/3/2019 2:31:11 PM
Sodium	29.8	0.050		mg/L	1	7/3/2019 2:31:11 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	0.016	0.005		mg/L	1	7/3/2019 5:53:36 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	ND	0.20		mg/L	2	7/11/2019 7:22:54 AM
Chloride	29.4	2.00		mg/L	2	7/11/2019 7:22:54 AM
Sulfate	354	10.0		mg/L	10	7/11/2019 7:41:56 AM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	440	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	1110	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-8
Collection Date: 6/21/2019
Lab Sample ID: 190625007-005
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	ND	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	0.055	0.005		mg/L	1	7/3/2019 2:41:27 PM
Barium	0.132	0.010		mg/L	1	7/3/2019 2:41:27 PM
Boron	2.41	0.050		mg/L	1	7/3/2019 2:41:27 PM
Calcium	219	0.500		mg/L	10	7/3/2019 3:02:35 PM
Magnesium	21.7	0.050		mg/L	1	7/3/2019 2:41:27 PM
Potassium	10.2	0.050		mg/L	1	7/3/2019 2:41:27 PM
Sodium	13.8	0.050		mg/L	1	7/3/2019 2:41:27 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	0.050	0.005		mg/L	1	7/3/2019 5:58:48 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	ND	0.20		mg/L	2	7/11/2019 8:22:55 AM
Chloride	16.0	2.00		mg/L	2	7/11/2019 8:22:55 AM
Sulfate	325	10.0		mg/L	10	7/11/2019 8:41:57 AM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	330	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	855	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-9
Collection Date: 6/21/2019
Lab Sample ID: 190625007-006
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	7.0	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 3:07:41 PM
Barium	0.106	0.010		mg/L	1	7/3/2019 3:07:41 PM
Boron	1.62	0.050		mg/L	1	7/3/2019 3:07:41 PM
Calcium	93.7	0.050		mg/L	1	7/3/2019 3:07:41 PM
Magnesium	24.9	0.050		mg/L	1	7/3/2019 3:07:41 PM
Potassium	16.4	0.050		mg/L	1	7/3/2019 3:07:41 PM
Sodium	38.8	0.050		mg/L	1	7/3/2019 3:07:41 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 6:04:01 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	0.46	0.20		mg/L	2	7/11/2019 4:58:42 PM
Chloride	64.3	2.00		mg/L	2	7/11/2019 4:58:42 PM
Sulfate	12.4	2.00		mg/L	2	7/11/2019 4:58:42 PM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	440	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	590	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-10
Collection Date: 6/21/2019
Lab Sample ID: 190625007-007
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	ND	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 3:17:59 PM
Barium	0.119	0.010		mg/L	1	7/3/2019 3:17:59 PM
Boron	1.20	0.050		mg/L	1	7/3/2019 3:17:59 PM
Calcium	295	0.500		mg/L	10	7/3/2019 3:23:11 PM
Magnesium	28.9	0.050		mg/L	1	7/3/2019 3:17:59 PM
Potassium	11.5	0.050		mg/L	1	7/3/2019 3:17:59 PM
Sodium	22.9	0.050		mg/L	1	7/3/2019 3:17:59 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 6:09:11 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	0.42	0.20		mg/L	2	7/11/2019 9:01:00 AM
Chloride	46.5	2.00		mg/L	2	7/11/2019 9:01:00 AM
Sulfate	193	10.0		mg/L	10	7/11/2019 9:20:02 AM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	610	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	1030	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-11
Collection Date: 6/21/2019
Lab Sample ID: 190625007-008
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	ND	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 3:28:19 PM
Barium	0.116	0.010		mg/L	1	7/3/2019 3:28:19 PM
Boron	0.658	0.050		mg/L	1	7/3/2019 3:28:19 PM
Calcium	79.6	0.050		mg/L	1	7/3/2019 3:28:19 PM
Magnesium	20.1	0.050		mg/L	1	7/3/2019 3:28:19 PM
Potassium	9.02	0.050		mg/L	1	7/3/2019 3:28:19 PM
Sodium	85.2	0.500		mg/L	10	7/3/2019 3:33:28 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 6:14:24 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	0.24	0.20		mg/L	2	7/11/2019 5:17:44 PM
Chloride	82.6	2.00		mg/L	2	7/11/2019 5:17:44 PM
Sulfate	107	2.00		mg/L	2	7/11/2019 5:17:44 PM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	280	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	565	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: Dup
Collection Date: 6/21/2019
Lab Sample ID: 190625007-009
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	ND	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 3:38:30 PM
Barium	0.120	0.010		mg/L	1	7/3/2019 3:38:30 PM
Boron	1.19	0.050		mg/L	1	7/3/2019 3:38:30 PM
Calcium	266	0.500		mg/L	10	7/3/2019 3:43:40 PM
Magnesium	28.9	0.050		mg/L	1	7/3/2019 3:38:30 PM
Potassium	11.4	0.050		mg/L	1	7/3/2019 3:38:30 PM
Sodium	23.0	0.050		mg/L	1	7/3/2019 3:38:30 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 6:19:38 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	0.41	0.20		mg/L	2	7/11/2019 5:36:47 PM
Chloride	45.2	2.00		mg/L	2	7/11/2019 5:36:47 PM
Sulfate	205	20.0		mg/L	20	7/11/2019 5:55:50 PM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	620	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	1100	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: EQ-1
Collection Date: 6/21/2019
Lab Sample ID: 190625007-010
Matrix: SURFACE WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	0.9	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 3:48:45 PM
Barium	0.019	0.010		mg/L	1	7/3/2019 3:48:45 PM
Boron	0.188	0.050		mg/L	1	7/3/2019 3:48:45 PM
Calcium	335	0.500		mg/L	10	7/3/2019 4:09:48 PM
Magnesium	33.9	0.050		mg/L	1	7/3/2019 3:48:45 PM
Potassium	9.71	0.050		mg/L	1	7/3/2019 3:48:45 PM
Sodium	29.7	0.050		mg/L	1	7/3/2019 3:48:45 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 6:40:48 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	ND	0.20		mg/L	2	7/11/2019 6:14:51 PM
Chloride	19.5	2.00		mg/L	2	7/11/2019 6:14:51 PM
Sulfate	921	20.0		mg/L	20	7/11/2019 6:33:53 PM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	31	1		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	1540	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: EQ-2
Collection Date: 6/21/2019
Lab Sample ID: 190625007-011
Matrix: SURFACE WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	25.7	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 4:14:54 PM
Barium	0.011	0.010		mg/L	1	7/3/2019 4:14:54 PM
Boron	ND	0.050		mg/L	1	7/3/2019 4:14:54 PM
Calcium	13.3	0.050		mg/L	1	7/3/2019 4:14:54 PM
Magnesium	1.09	0.050		mg/L	1	7/3/2019 4:14:54 PM
Potassium	0.663	0.050		mg/L	1	7/3/2019 4:14:54 PM
Sodium	8.60	0.050		mg/L	1	7/3/2019 4:14:54 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 6:45:57 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	ND	0.20		mg/L	2	7/11/2019 6:52:55 PM
Chloride	13.4	2.00		mg/L	2	7/11/2019 6:52:55 PM
Sulfate	6.61	2.00		mg/L	2	7/11/2019 6:52:55 PM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	36	2		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	120	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: SSP
Collection Date: 6/21/2019
Lab Sample ID: 190625007-012
Matrix: SURFACE WATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	0.9	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 4:24:52 PM
Barium	0.139	0.010		mg/L	1	7/3/2019 4:24:52 PM
Boron	0.208	0.050		mg/L	1	7/3/2019 4:24:52 PM
Calcium	44.6	0.050		mg/L	1	7/3/2019 4:24:52 PM
Magnesium	14.3	0.050		mg/L	1	7/3/2019 4:24:52 PM
Potassium	5.51	0.050		mg/L	1	7/3/2019 4:24:52 PM
Sodium	98.2	0.500		mg/L	10	7/3/2019 4:30:05 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 6:51:00 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	0.28	0.20		mg/L	2	7/11/2019 8:28:52 PM
Chloride	137	2.00		mg/L	2	7/11/2019 8:28:52 PM
Sulfate	82.7	2.00		mg/L	2	7/11/2019 8:28:52 PM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	150	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	460	5		mg/L	1	6/28/2019

Adirondack Environmental Services, Inc

Date: 17-Jul-19

CLIENT: Frontier Technical Associates
Work Order: 190625007
Reference: Plant N CCR GW /
PO#:

Client Sample ID: CCR-A-2
Collection Date: 6/21/2019
Lab Sample ID: 190625007-013
Matrix: GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
LOW LEVEL MERCURY - EPA 1631E Analyst: WB						
(Prep: 1631E - 6/25/2019)						
Mercury	0.7	0.5		ng/L	1	6/26/2019
ICP METALS - EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic	ND	0.005		mg/L	1	7/3/2019 4:35:09 PM
Barium	0.026	0.010		mg/L	1	7/3/2019 4:35:09 PM
Boron	0.408	0.050		mg/L	1	7/3/2019 4:35:09 PM
Calcium	454	0.500		mg/L	10	7/3/2019 4:40:19 PM
Magnesium	44.0	0.050		mg/L	1	7/3/2019 4:35:09 PM
Potassium	7.45	0.050		mg/L	1	7/3/2019 4:35:09 PM
Sodium	87.1	0.500		mg/L	10	7/3/2019 4:40:19 PM
ICP DISSOLVED META L- EPA 200.7 REV 4.4 Analyst: SM						
(Prep: - 6/25/2019)						
Arsenic, Dissolved	ND	0.005		mg/L	1	7/3/2019 6:56:12 PM
ANIONS BY ION CHROMATOGRAPHY - EPA 300.0 REV 2.1 Analyst: CS						
Fluoride	0.49	0.20		mg/L	2	7/11/2019 9:06:56 PM
Chloride	77.4	2.00		mg/L	2	7/11/2019 9:06:56 PM
Sulfate	1320	50.0		mg/L	50	7/11/2019 9:25:58 PM
ALKALINITY TO PH 4.5 -SM 2320B-2011 Analyst: DAA						
Alkalinity, Total (As CaCO3)	270	10		mgCaCO3/L	1	7/1/2019
TOTAL DISSOLVED SOLIDS - SM 2540C-2011 Analyst: CC						
TDS (Residue, Filterable)	2310	5		mg/L	1	6/28/2019

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT**BatchID: 74127**

MBLK	SeqNo: 2648450	PrepDate:	TestNo: E200.8	RunNo: 172672
	Samp ID: MBLK	PrepRef:	Units: mg/L	Analysis Date: 6/25/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.00100									
Barium	ND	0.00200									

LCS	SeqNo: 2648451	PrepDate:	TestNo: E200.8	RunNo: 172672
	Samp ID: LCS	PrepRef:	Units: mg/L	Analysis Date: 6/25/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.01845	0.00100	0.02	0	92.2	85	115	0	0		
Barium	0.01882	0.00200	0.02	0	94.1	85	115	0	0		

MS	SeqNo: 2648457	PrepDate:6/25/2019	TestNo: E200.8	RunNo: 172672
	Samp ID: 190624052-002	PrepRef:	Units: mg/L	Analysis Date: 6/25/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.04088	0.00100	0.04	0.005935	87.4	70	130	0	0		
Barium	1.954	0.00200	2	0.07276	94.1	70	130	0	0		

DUP	SeqNo: 2648456	PrepDate:6/25/2019	TestNo: E200.8	RunNo: 172672
	Samp ID: 190624052-002	PrepRef:	Units: mg/L	Analysis Date: 6/25/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.005934	0.00100	0	0	0	0	0	0.005935	0.0144	20	
Barium	0.07213	0.00200	0	0	0	0	0	0.07276	0.865	20	

MBLK	SeqNo: 2650573	PrepDate:6/25/2019	TestNo: E200.7	RunNo: 172789
	Samp ID: MB-74127	PrepRef:	Units: mg/L	Analysis Date: 6/27/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.00500									
Barium	ND	0.0100									
Boron	ND	0.0500									
Calcium	ND	0.0500									
Magnesium	ND	0.0500									

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: 74127

MBLK	SeqNo: 2650573	PrepDate: 6/25/2019	TestNo: E200.7	RunNo: 172789
	Samp ID: MB-74127	PrepRef:	Units: mg/L	Analysis Date: 6/27/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	ND	0.0500									
Sodium	ND	0.0500									

LCS	SeqNo: 2650574	PrepDate: 6/25/2019	TestNo: E200.7	RunNo: 172789
	Samp ID: LCS-74127	PrepRef:	Units: mg/L	Analysis Date: 6/27/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	2.058	0.00500	2	0	103	89.1	111	0	0		
Barium	2.01	0.0100	2	0	100	85	115	0	0		
Boron	2.11	0.0500	2	0	106	88.2	114	0	0		
Calcium	2.098	0.0500	2	0	105	85.6	114	0	0		
Magnesium	1.965	0.0500	2	0	98.2	87.4	110	0	0		
Potassium	9.09	0.0500	10	0	90.9	85	112	0	0		
Sodium	1.902	0.0500	2	0	95.1	85.8	113	0	0		

MS	SeqNo: 2655169	PrepDate: 6/25/2019	TestNo: E200.7	RunNo: 173026
	Samp ID: 190624052-002	PrepRef:	Units: mg/L	Analysis Date: 7/8/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.04691	0.00500	0.04	0.006559	101	75	125	0	0		
Barium	2.035	0.0100	2	0.08581	97.5	75	119	0	0		

MS	SeqNo: 2659426	PrepDate:	TestNo: E200.7	RunNo: 173014
	Samp ID: 190625007-002 (CCR-2)	PrepRef:	Units: mg/L	Analysis Date: 7/3/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0416	0.00500	0.04	0.02372	44.7	75	125	0	0		S
Barium	2.124	0.0100	2	0.05158	104	75	119	0	0		

DUP	SeqNo: 2655168	PrepDate: 6/25/2019	TestNo: E200.7	RunNo: 173026
	Samp ID: 190624052-002	PrepRef:	Units: mg/L	Analysis Date: 7/8/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.006917	0.00500	0	0	0	0	0	0.006559	5.31	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: 74127

DUP	SeqNo: 2655168	PrepDate: 6/25/2019	TestNo: E200.7	RunNo: 173026
	Samp ID: 190624052-002	PrepRef:	Units: mg/L	Analysis Date: 7/8/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	0.08446	0.0100	0	0	0	0	0	0.08581	1.58	20	
Boron	0.05764	0.0500	0	0	0	0	0	0.06042	4.71	20	
Calcium	103	0.0500	0	0	0	0	0	105	1.89	13.9	
Magnesium	14.86	0.0500	0	0	0	0	0	15.2	2.22	15.6	
Potassium	4.333	0.0500	0	0	0	0	0	4.456	2.80	15.2	
Sodium	26.68	0.0500	0	0	0	0	0	27.25	2.10	15.7	

DUP	SeqNo: 2659424	PrepDate:	TestNo: E200.7	RunNo: 173014
	Samp ID: 190625007-002	PrepRef:	Units: mg/L	Analysis Date: 7/3/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.00500	0	0	0	0	0	0.02372	0	20	
Barium	0.1268	0.0100	0	0	0	0	0	0.05158	84.3	20	Z
Boron	0.2861	0.0500	0	0	0	0	0	4.038	174	20	Z
Calcium	60.32	0.0500	0	0	0	0	0	91.16	40.7	13.9	Z
Magnesium	16.07	0.0500	0	0	0	0	0	14.3	11.6	15.6	
Potassium	6.745	0.0500	0	0	0	0	0	21.78	105	15.2	Z

DUP	SeqNo: 2659425	PrepDate:	TestNo: E200.7	RunNo: 173014
	Samp ID: 190625007-002	PrepRef:	Units: mg/L	Analysis Date: 7/3/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	170.4	0.500	0	0	0	0	0	41.43	122	15.7	Z

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: 74139

MBLK	SeqNo: 2649219	PrepDate:6/25/2019		TestNo: E1631		RunNo: 172711	
	Samp ID: MB-74139	PrepRef:(1631E)		Units: ng/L		Analysis Date: 6/26/2019	

<u>Analyte</u>	<u>Result</u>	<u>PQL</u>	<u>SPK value</u>	<u>SPK Ref Val</u>	<u>%REC</u>	<u>LowLimit</u>	<u>HighLimit</u>	<u>RPD Ref Val</u>	<u>%RPD</u>	<u>RPDLimit</u>	<u>Qual</u>
Mercury	ND	0.500									

MBLK	SeqNo: 2649630	PrepDate:6/25/2019		TestNo: E1631		RunNo: 172711	
	Samp ID: MB-74139	PrepRef:(1631E)		Units: ng/L		Analysis Date: 6/26/2019	

<u>Analyte</u>	<u>Result</u>	<u>PQL</u>	<u>SPK value</u>	<u>SPK Ref Val</u>	<u>%REC</u>	<u>LowLimit</u>	<u>HighLimit</u>	<u>RPD Ref Val</u>	<u>%RPD</u>	<u>RPDLimit</u>	<u>Qual</u>
Mercury	ND	0.500									

MBLK	SeqNo: 2649642	PrepDate:6/25/2019		TestNo: E1631		RunNo: 172711	
	Samp ID: MB-74139	PrepRef:(1631E)		Units: ng/L		Analysis Date: 6/26/2019	

<u>Analyte</u>	<u>Result</u>	<u>PQL</u>	<u>SPK value</u>	<u>SPK Ref Val</u>	<u>%REC</u>	<u>LowLimit</u>	<u>HighLimit</u>	<u>RPD Ref Val</u>	<u>%RPD</u>	<u>RPDLimit</u>	<u>Qual</u>
Mercury	ND	0.500									

LCS	SeqNo: 2649220	PrepDate:6/25/2019		TestNo: E1631		RunNo: 172711	
	Samp ID: LCS-74139	PrepRef:(1631E)		Units: ng/L		Analysis Date: 6/26/2019	

<u>Analyte</u>	<u>Result</u>	<u>PQL</u>	<u>SPK value</u>	<u>SPK Ref Val</u>	<u>%REC</u>	<u>LowLimit</u>	<u>HighLimit</u>	<u>RPD Ref Val</u>	<u>%RPD</u>	<u>RPDLimit</u>	<u>Qual</u>
Mercury	10.6	0.500	10	0	106	77	123	0	0		

LCS	SeqNo: 2649631	PrepDate:6/25/2019		TestNo: E1631		RunNo: 172711	
	Samp ID: LCS-74139	PrepRef:(1631E)		Units: ng/L		Analysis Date: 6/26/2019	

<u>Analyte</u>	<u>Result</u>	<u>PQL</u>	<u>SPK value</u>	<u>SPK Ref Val</u>	<u>%REC</u>	<u>LowLimit</u>	<u>HighLimit</u>	<u>RPD Ref Val</u>	<u>%RPD</u>	<u>RPDLimit</u>	<u>Qual</u>
Mercury	10.2	0.500	10	0	102	77	123	0	0		

LCS	SeqNo: 2649643	PrepDate:6/25/2019		TestNo: E1631		RunNo: 172711	
	Samp ID: LCS-74139	PrepRef:(1631E)		Units: ng/L		Analysis Date: 6/26/2019	

<u>Analyte</u>	<u>Result</u>	<u>PQL</u>	<u>SPK value</u>	<u>SPK Ref Val</u>	<u>%REC</u>	<u>LowLimit</u>	<u>HighLimit</u>	<u>RPD Ref Val</u>	<u>%RPD</u>	<u>RPDLimit</u>	<u>Qual</u>
Mercury	9.62	0.500	10	0	96.2	77	123	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: 74139

MS	SeqNo: 2649634	PrepDate:6/25/2019	TestNo: E1631	RunNo: 172711
	Samp ID: 190625007-002 (CCR-2)	PrepRef:(1631E)	Units: ng/L	Analysis Date: 6/26/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	12.6	0.500	12.5	1.01	92.7	71	125	0	0		

MSD	SeqNo: 2649635	PrepDate:6/25/2019	TestNo: E1631	RunNo: 172711
	Samp ID: 190625007-002 (CCR-2)	PrepRef:(1631E)	Units: ng/L	Analysis Date: 6/26/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	12.7	0.500	12.5	1.01	93.5	71	125	12.6	0.791	24	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: 74142

MBLK	SeqNo: 2649310	PrepDate: 6/25/2019	TestNo: E200.7F	RunNo: 172717
	Samp ID: MB-74142	PrepRef:	Units: mg/L	Analysis Date: 6/26/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, Dissolved	ND	0.00500									

LCS	SeqNo: 2649311	PrepDate: 6/25/2019	TestNo: E200.7F	RunNo: 172717
	Samp ID: LCS-74142	PrepRef:	Units: mg/L	Analysis Date: 6/26/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, Dissolved	1.991	0.00500	2	0	99.6	85	115	0	0		

MS	SeqNo: 2654695	PrepDate: 6/25/2019	TestNo: E200.7F	RunNo: 173014
	Samp ID: 190625007-001 (CCR-1)	PrepRef:	Units: mg/L	Analysis Date: 7/3/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, Dissolved	0.04196	0.00500	0.04	0.001686	101	75	123	0	0		

DUP	SeqNo: 2654694	PrepDate: 6/25/2019	TestNo: E200.7F	RunNo: 173014
	Samp ID: 190625007-001	PrepRef:	Units: mg/L	Analysis Date: 7/3/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic, Dissolved	ND	0.00500	0	0	0	0	0	0.001686	0	17.3	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R172842

MBLK	SeqNo: 2651452	TestNo: SM2320B	RunNo: 172842
	Samp ID: MB-R172842	Units: mgCaCO3/L	Analysis Date: 6/29/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	1	1.00									

LCS	SeqNo: 2651453	TestNo: SM2320B	RunNo: 172842
	Samp ID: LCS-R172842	Units: mgCaCO3/L	Analysis Date: 6/29/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	190	5.00	190	0	100	88.6	115	0	0		

MS	SeqNo: 2651471	TestNo: SM2320B	RunNo: 172842
	Samp ID: 190625007-002 (CCR-2)	Units: mgCaCO3/L	Analysis Date: 6/29/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	810	10.0	500	300	102	80	120	0	0		

MSD	SeqNo: 2651472	TestNo: SM2320B	RunNo: 172842
	Samp ID: 190625007-002 (CCR-2)	Units: mgCaCO3/L	Analysis Date: 6/29/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	810	10.0	500	300	102	80	120	810	0	15	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R172888

MBLK	SeqNo: 2652363	TestNo: SM2320B	RunNo: 172888
	Samp ID: MB-R172888	Units: mgCaCO3/L	Analysis Date: 7/1/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	1	1.00									

LCS	SeqNo: 2652364	TestNo: SM2320B	RunNo: 172888
	Samp ID: LCS-R172888	Units: mgCaCO3/L	Analysis Date: 7/1/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	195	5.00	190	0	103	88.6	115	0	0		

MS	SeqNo: 2652380	TestNo: SM2320B	RunNo: 172888
	Samp ID: 190627022-003	Units: mgCaCO3/L	Analysis Date: 7/1/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	830	10.0	500	330	100	80	120	0	0		

MSD	SeqNo: 2652381	TestNo: SM2320B	RunNo: 172888
	Samp ID: 190627022-003	Units: mgCaCO3/L	Analysis Date: 7/1/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	820	10.0	500	330	98	80	120	830	1.21	15	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R172899

LCS	SeqNo: 2652667	TestNo: SM2540C	RunNo: 172899
	Samp ID: LCS-R172899	Units: mg/L	Analysis Date: 6/28/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TDS (Residue, Filterable)	380	5.00	353	0	108	85.4	114	0	0		

DUP	SeqNo: 2652672	TestNo: SM2540C	RunNo: 172899
	Samp ID: 190621046-002	Units: mg/L	Analysis Date: 6/28/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TDS (Residue, Filterable)	55	5.00	0	0	0	0	0	65	16.7	10	Z

DUP	SeqNo: 2652686	TestNo: SM2540C	RunNo: 172899
	Samp ID: 190625007-002	Units: mg/L	Analysis Date: 6/28/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TDS (Residue, Filterable)	645	5.00	0	0	0	0	0	625	3.15	10	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173141

MBLK	SeqNo: 2657108	TestNo: E300	RunNo: 173141
	Samp ID: MBLK 3447 DI	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	1.00									
Fluoride	ND	0.100									
Sulfate	ND	1.00									

LCS	SeqNo: 2657109	TestNo: E300	RunNo: 173141
	Samp ID: LCS IC070819C	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	202.1	100	200	0	101	90	110	0	0		
Fluoride	102	10.0	100	0	102	90	110	0	0		
Sulfate	435.1	100	400	0	109	90	110	0	0		

LCS	SeqNo: 2657130	TestNo: E300	RunNo: 173141
	Samp ID: LCS	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	206.1	100	200	0	103	90	110	0	0		
Fluoride	96.9	10.0	100	0	96.9	90	110	0	0		
Sulfate	430.9	100	400	0	108	90	110	0	0		

LCS	SeqNo: 2657152	TestNo: E300	RunNo: 173141
	Samp ID: LCS	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	206.2	100	200	0	103	90	110	0	0		
Fluoride	102.5	10.0	100	0	103	90	110	0	0		
Sulfate	425.9	100	400	0	106	90	110	0	0		

MS	SeqNo: 2657116	TestNo: E300	RunNo: 173141
	Samp ID: 190621004-016a	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	937.2	50.0	500	442.7	98.9	90	110	0	0		
Sulfate	2028	50.0	500	1533	99	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173141

MS	SeqNo: 2657126	TestNo: E300	RunNo: 173141
	Samp ID: 190621004-022a	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	438.3	20.0	200	241.2	98.5	90	110	0	0		
Sulfate	1258	20.0	200	1062	97.9	90	110	0	0		

MS	SeqNo: 2657147	TestNo: E300	RunNo: 173141
	Samp ID: 190625007-002c (CCR-2)	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	10.42	0.200	10	0.246	102	90	110	0	0		
Chloride	51.28	2.00	20	32.68	93	90	110	0	0		
Sulfate	114.3	2.00	20	95.4	94.4	90	110	0	0		

MSD	SeqNo: 2657148	TestNo: E300	RunNo: 173141
	Samp ID: 190625007-002c (CCR-2)	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	10.43	0.200	10	0.246	102	90	110	10.42	0.153	20	
Chloride	51.47	2.00	20	32.68	93.9	90	110	51.28	0.363	20	
Sulfate	115	2.00	20	95.4	97.9	90	110	114.3	0.619	20	

DUP	SeqNo: 2657123	TestNo: E300	RunNo: 173141
	Samp ID: 190621004-020a	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	35.44	2.00	0	0	0	0	0	35.43	0.00940	19.6	
Sulfate	23.64	2.00	0	0	0	0	0	23.51	0.543	10.9	

DUP	SeqNo: 2657132	TestNo: E300	RunNo: 173141
	Samp ID: 190621004-025a	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.117	2.00	0	0	0	0	0	5.148	0.611	19.6	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173141

ICB	SeqNo: 2657107	TestNo: E300	RunNo: 173141
	Samp ID: ICB 3447 DI	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	1.00	0	0	0	0	0	0	0		
Fluoride	ND	0.100	0	0	0	0	0	0	0		
Sulfate	ND	1.00	0	0	0	0	0	0	0		

ICV	SeqNo: 2657106	TestNo: E300	RunNo: 173141
	Samp ID: ICV IC070919C	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	9.164	1.00	10	0	91.6	90	110	0	0		
Fluoride	1.033	0.100	1	0	103	90	110	0	0		
Sulfate	10.24	1.00	10	0	102	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173158

MBLK	SeqNo: 2657395	TestNo: E300	RunNo: 173158
	Samp ID: MBLK 3447 DI	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	1.00									
Fluoride	ND	0.100									
Sulfate	ND	1.00									

LCS	SeqNo: 2657396	TestNo: E300	RunNo: 173158
	Samp ID: LCS IC070819C	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	195.1	100	200	0	97.6	90	110	0	0		
Fluoride	102.4	10.0	100	0	102	90	110	0	0		
Sulfate	407.3	100	400	0	102	90	110	0	0		

LCS	SeqNo: 2657417	TestNo: E300	RunNo: 173158
	Samp ID: LCS	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	194.6	100	200	0	97.3	90	110	0	0		
Fluoride	102.1	10.0	100	0	102	90	110	0	0		
Sulfate	408.1	100	400	0	102	90	110	0	0		

LCS	SeqNo: 2657439	TestNo: E300	RunNo: 173158
	Samp ID: LCS	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	195.4	100	200	0	97.7	90	110	0	0		
Fluoride	102	10.0	100	0	102	90	110	0	0		
Sulfate	403.7	100	400	0	101	90	110	0	0		

MS	SeqNo: 2657407	TestNo: E300	RunNo: 173158
	Samp ID: 190710069-001a	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	40.41	2.00	20	20.74	98.4	90	110	0	0		
Fluoride	10.44	0.200	10	0.216	102	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173158

MS	SeqNo: 2657407	TestNo: E300	RunNo: 173158
	Samp ID: 190710069-001a	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	37.54	2.00	20	17.31	101	90	110	0	0		

MS	SeqNo: 2657423	TestNo: E300	RunNo: 173158
	Samp ID: 190710070-012b	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	88.73	2.00	20	70.42	91.5	90	110	0	0		
Fluoride	10.58	0.200	10	0.28	103	90	110	0	0		
Sulfate	79.44	2.00	20	59.16	101	90	110	0	0		

MSD	SeqNo: 2657408	TestNo: E300	RunNo: 173158
	Samp ID: 190710069-001a	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	40.4	2.00	20	20.74	98.3	90	110	40.41	0.0297	20	
Fluoride	10.54	0.200	10	0.216	103	90	110	10.44	0.934	20	
Sulfate	37.59	2.00	20	17.31	101	90	110	37.54	0.123	20	

MSD	SeqNo: 2657424	TestNo: E300	RunNo: 173158
	Samp ID: 190710070-012b	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	88.59	2.00	20	70.42	90.8	90	110	88.73	0.160	20	
Fluoride	10.61	0.200	10	0.28	103	90	110	10.58	0.340	20	
Sulfate	79.36	2.00	20	59.16	101	90	110	79.44	0.102	20	

CRI	SeqNo: 2657397	TestNo: E300	RunNo: 173158
	Samp ID: CRI ICA-79-E	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	1.00	1	0	93.5	50	150	0	0		
Fluoride	0.1	0.100	0.1	0	100	50	150	0	0		
Sulfate	2.02	1.00	2	0	101	50	150	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173158

ICB	SeqNo: 2657394	TestNo: E300	RunNo: 173158
	Samp ID: ICB 3447 DI	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	1.00	0	0	0	0	0	0	0		
Fluoride	ND	0.100	0	0	0	0	0	0	0		
Sulfate	ND	1.00	0	0	0	0	0	0	0		

ICV	SeqNo: 2657393	TestNo: E300	RunNo: 173158
	Samp ID: ICV IC070919C	Units: mg/L	Analysis Date: 7/10/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	9.405	1.00	10	0	94.1	90	110	0	0		
Fluoride	0.982	0.100	1	0	98.2	90	110	0	0		
Sulfate	9.924	1.00	10	0	99.2	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173185

MBLK	SeqNo: 2657921	TestNo: E300	RunNo: 173185
	Samp ID: MBLK 3447 DI	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	1.00									
Fluoride	ND	0.100									
Sulfate	ND	1.00									

LCS	SeqNo: 2657922	TestNo: E300	RunNo: 173185
	Samp ID: LCS IC070819C	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	195.8	100	200	0	97.9	90	110	0	0		
Fluoride	102	10.0	100	0	102	90	110	0	0		
Sulfate	407.1	100	400	0	102	90	110	0	0		

LCS	SeqNo: 2657944	TestNo: E300	RunNo: 173185
	Samp ID: LCS	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	194.8	100	200	0	97.4	90	110	0	0		
Fluoride	101.7	10.0	100	0	102	90	110	0	0		
Sulfate	406.2	100	400	0	102	90	110	0	0		

LCS	SeqNo: 2657966	TestNo: E300	RunNo: 173185
	Samp ID: LCS	Units: mg/L	Analysis Date: 7/12/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	197	100	200	0	98.5	90	110	0	0		
Fluoride	101.8	10.0	100	0	102	90	110	0	0		
Sulfate	405.4	100	400	0	101	90	110	0	0		

MS	SeqNo: 2657932	TestNo: E300	RunNo: 173185
	Samp ID: 190625007-011c (EQ-2)	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	32.85	2.00	20	13.4	97.3	90	110	0	0		
Fluoride	10.38	0.200	10	0	104	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173185

MS	SeqNo: 2657932	TestNo: E300	RunNo: 173185
	Samp ID: 190625007-011c (EQ-2)	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	26.64	2.00	20	6.609	100	90	110	0	0		

MS	SeqNo: 2657961	TestNo: E300	RunNo: 173185
	Samp ID: 190703079-001c	Units: mg/L	Analysis Date: 7/12/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1032	20.0	200	828.3	102	90	110	0	0		
Fluoride	116.1	2.00	100	10	106	90	110	0	0		
Sulfate	801	20.0	200	587.4	107	90	110	0	0		

DUP	SeqNo: 2657934	TestNo: E300	RunNo: 173185
	Samp ID: 190625007-012c	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	136.7	2.00	0	0	0	0	0	137.1	0.303	19.6	
Fluoride	0.27	0.200	0	0	0	0	0	0.28	3.64	11.6	
Sulfate	82.58	2.00	0	0	0	0	0	82.73	0.176	10.9	

DUP	SeqNo: 2657963	TestNo: E300	RunNo: 173185
	Samp ID: 190702046-002e	Units: mg/L	Analysis Date: 7/12/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	5.074	0.200	0	0	0	0	0	5.128	1.06	11.6	

ICB	SeqNo: 2657920	TestNo: E300	RunNo: 173185
	Samp ID: ICB 3447 DI	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	1.00	0	0	0	0	0	0	0		
Fluoride	ND	0.100	0	0	0	0	0	0	0		
Sulfate	ND	1.00	0	0	0	0	0	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Frontier Technical Associates
Work Order: 190625007
Project: Plant N CCR GW

ANALYTICAL QC SUMMARY REPORT

BatchID: R173185

ICV	SeqNo: 2657919	TestNo: E300	RunNo: 173185
	Samp ID: ICV IC070919C	Units: mg/L	Analysis Date: 7/11/2019

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	9.401	1.00	10	0	94	90	110	0	0		
Fluoride	0.977	0.100	1	0	97.7	90	110	0	0		
Sulfate	9.92	1.00	10	0	99.2	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank



314 North Pearl Street
Albany, New York 12207
518-434-4546/434-0891 FAX

CHAIN OF CUSTODY RECORD

AES Work Order #

190625007

Experience is the solution

A full service analytical research laboratory offering solutions to environmental concerns

Client Name: Frontier Technical Associates, Inc.		Address: 8675 Main Street, Williamsville, NY 14221	
Send Report To: David Harty		Project Name (Location): Plant N CCR	
Client Phone No: 716-634-2293		Client Email: david.harty@frontiertechanical.com	
PO Number:		Samplers: (Names) David Harty / Ron Barton	
PO Number:		Samplers: (Signature) [Signature]	

AES Sample Number	Client Sample Identification & Location	Date Sampled	Time A=a.m. P=p.m.	Sample Type			Number of Cont's	Analysis Required
				Matrix	Comp	Grab		
001	CCR-1	6/21/19	12:30	GW	X		6	Metals
002	CCR-2		10:42	GW	X			Cl ⁻ , F ⁻
003	CCR-3		12:18	GW	X			SO ₄ , TDS
004	CCR-7		11:19	GW	X			LL Mercury
005	CCR-8		11:32	GW	X			Alkalinity
006	CCR-9		10:58	GW	X			Dissolved As
007	CCR-10		10:25	GW	X			
008	CCR-11		1:16	GW	X			
009	Dup			GW	X			
010	EQ-1		1:57	S	X			
011	EQ-2		1:48	S	X			
012	SSP		1:35	S	X			
013	CCR-A-2		9:55	GW	X			
* MS/MSD					X			

Shipment Arrived Via:

FedEx UPS Client AES Other:

Turnaround Time Request:

☐ 1 Day ☐ 3 Day ☒ Normal
☐ 2 Day ☐ 5 Day

Note: Samples received after 3:30 pm are considered next business day

CC Report To / Special Instructions/Remarks:

Metals = Boron, Ca, As, Ba, Mg, Na, K
Dissolved Arsenic was field filtered.

* MS/MSD CCR-2 per D. Harty KAM
6/25

Relinquished by: (Signature)

[Signature]

Received by: (Signature)

To Fed Ex

Date/Time

6/24/19 4:30 pm

Relinquished by: (Signature)

Received for Laboratory by:

Kraz

Date/Time

6/25/19 9:52 am

TEMPERATURE

Ambient or Chilled

Notes:

9°C

AES Bottles

Y

N

☒

☐

PROPERLY PRESERVED

Y

N

Notes:

RECEIVED WITHIN HOLDING TIMES

Y

N

Notes:

WHITE - Lab Copy

YELLOW - Sampler Copy

Adirondack Environmental S



190625007



Experience is the solution

314 North Pearl Street • Albany, New York 12207 • (518) 434-4546 • Fax (518) 434-0891

TERMS, CONDITIONS & LIMITATIONS

All service rendered by the **Adirondack Environmental Services, Inc.** are undertaken and all rates are based upon the following terms:

- (a) Neither **Adirondack Environmental Services, Inc.**, nor any of its employees, agents or sub-contractors shall be liable for any loss or damage arising out of **Adirondack Environmental Services, Inc.**'s performance or nonperformance, whether by way of negligence or breach of contract, or otherwise, in any amount greater than twice the amount billed to the customer for the work leading to the claim of the customer. Said remedy shall be the sole and exclusive remedy against **Adirondack Environmental Services, Inc.** arising out of its work.
- (b) All claims made must be in writing within forty-five (45) days after delivery of the **Adirondack Environmental Services, Inc.** report regarding said work or such claim shall be deemed or irrevocably waived.
- (c) **Adirondack Environmental Services, Inc.** reports are submitted in writing and are for our customers only. Our customers are considered to be only those entities being billed for our services. Acquisition of an **Adirondack Environmental Services, Inc.** report by other than our customer does not constitute a representation of **Adirondack Environmental Services, Inc.** as to the accuracy of the contents thereof.
- (d) In no event shall **Adirondack Environmental Services, Inc.**, its employees, agents or sub-contractors be responsible for consequential or special damages of any kind or in any amount.
- (e) No deviation from the terms set forth herein shall bind **Adirondack Environmental Services, Inc.** unless in writing and signed by a Director of **Adirondack Environmental Services, Inc.**
- (f) Results pertain only to items analyzed. Information supplied by client is assumed to be correct. This information may be used on reports and in calculations and **Adirondack Environmental Services, Inc.** is not responsible for the accuracy of this information.
- (g) Payments by Credit Card/Purchase Cards are subject to a 3% additional charge.