



Reid/Green/HMPL-2 Station
9000 Highway 2096
Robards, KY 42452
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July 11, 2019

Re: *Big Rivers Electric Corporation*

Reid/ Green/HMP&L Station II (Sebree Station AI 4196)

Assessment of Corrective Measures Reports

An Assessment of Corrective Measures (ACM) for groundwater was initiated by Big Rivers Electric Corporation at the Green Station Landfill and Reid/HMP&L Station II Surface Impoundment on January 14, 2019. The ACM was initiated based on the Green Station Landfill and Reid-HMP&L Surface Impoundment having one (1) constituent from Appendix IV of Part 257 that was detected at a statistically significant level (SSL) above the Regional Screening Level (RSL) for lithium. Regional Screening Levels were used in lieu of Maximum Contaminant Levels (MCL), since an MCL has not been established for the constituent of concern (i.e. Lithium) associated with the Green Landfill and the Reid-HMP&L Surface Impoundment.

The Coal Combustion Residuals Rule found at 40 CFR Part 257.96(a) requires that a facility initiate an ACM within 90 days of finding that any constituent listed in Appendix IV of Part 257 has been detected at a SSL exceeding the groundwater protection standard defined under 257.95(h). The ACM must be completed within 90 days. The 90-day deadline to complete the ACM may be extended for no longer than 60 days.

The documents contained herein fulfill the requirements of 40 CFR Part 257.96(a), (c) and (d).

Furthermore, pursuant to 40 CFR 257.90(d) and 257.84(b)(5), Big Rivers initiated design of containment systems at the Green Station Landfill intended to control sources of landfill surface seeps to reduce or eliminate, to the maximum extent feasible, further non-groundwater releases of contaminants to surface waters. An ACM report for the non-groundwater releases from the Green Station Landfill, in light of the remedial measures initiated pursuant to 40 CFR 257.90(d) and 257.84(b)(5), has also been completed and is made available herein.

Assessment of Corrective Measures Under the CCR Rule

CCR SURFACE IMPOUNDMENT REID/HMP&L STATION WEBSTER COUNTY, KENTUCKY

June 13, 2019

Prepared For:

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CONTENTS

Section	Page
ACRONYMS	III
EXECUTIVE SUMMARY	1
1.0 INTRODUCTION.....	4
2.0 DESCRIPTION OF CURRENT CONDITIONS	5
2.1 Site Background.....	5
2.2 Site Investigation and Interim Measures.....	5
2.3 Conceptual Site Model (CSM)	6
2.3.1 Physical Setting.....	6
2.3.2 Geology.....	7
2.3.3 Hydrogeology.....	7
2.3.4 Constituents of Concern (COCs)	7
2.3.5 Impacted Media.....	8
2.3.6 COCs Distribution	8
2.3.7 Groundwater Quality	8
2.3.8 Potential Receptors / Pathways	9
3.0 CORRECTIVE ACTION OBJECTIVE (CAO).....	10
4.0 TECHNOLOGY IDENTIFICATION AND SCREENING	11
5.0 CORRECTIVE ACTION ALTERNATIVES ASSEMBLY	13
5.1 Assumptions for Corrective Measure Alternatives Development	13
5.2 Groundwater Corrective Measures Alternatives Overview	13
5.2.1 Alternative #1 – No Action and Groundwater Monitoring	13
5.2.2 Alternative #2a – CIP, ICs, and Groundwater Monitoring.....	14
5.2.3 Alternative #2b – CbR, ICs, and Groundwater Monitoring	14
5.2.4 Alternative #3 – CiP, Hydraulic Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring	15
5.2.5 Alternative #4 – CiP, ICs, Physical Containment, Ex-Situ Treatment, and Groundwater Monitoring	16
6.0 ALTERNATIVE EVALUATION.....	17
6.1 Potential Data Gaps.....	17
7.0 REFERENCES.....	18

List of Tables

1. Reid/HMP&L Station Surface Impoundment Constituents of Concern (COCs)
2. Reid/HMP&L Station Surface Impoundment Characterization Sample Results
3. Potential Corrective Measures Options Technology Description/Overview
4. Corrective Measures Alternative Summary

List of Figures

1. Site Location Map
2. Well Location Map
3. Site Geologic Map
4. Cross-Section A-A'
5. Cross Section B-B'
6. Contaminants of Concern Distribution

List of Appendices

- A. Corrective Measures Technologies and Alternatives Evaluation Process

ACRONYMS

ACM	Assessment of Corrective Measures
AECOM	AECOM Technical Services, Inc.
ARARs	Applicable or Relevant and Appropriate Requirements
BREC	Big Rivers Electric Corporation
°C	Degrees Celsius
CAO	Corrective Action Objectives
CbR	Closure by Removal
CCR	Coal Combustion Residuals
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CiP	Closure in Place
cm/sec	Centimeters per second
COCs	Constituents of Concern
CSM	Conceptual Site Model
DO	Dissolved Oxygen
ft., amsl	Feet above mean sea level
GWPS	Groundwater Protection Standards
ICs	Institutional Controls
KGS	Kentucky Geological Survey
KPDES	Kentucky Pollution Discharge Elimination System
Li	Lithium
µS/cm	MicroSiemens per centimeter
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
mV	Millivolt
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
PRB	Permeable Reactive Barrier
RCRA	Resource Conservation and Recovery Act
Sebree Station	Sebree Generating Station
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

AECOM Technical Services, Inc. (AECOM) was retained by Big Rivers Electric Corporation (BREC) to prepare an Assessment of Corrective Measures (ACM) to identify appropriate corrective measures for groundwater impacted by coal combustion residuals (CCR). The subject groundwater impacts are associated with the CCR that has been historically managed within the Reid/HMP&L Station CCR Surface Impoundment (Reid/HMP&L Station Surface Impoundment) at the Sebree Generating Station (Sebree Station), located near Sebree, Kentucky (Site).

Groundwater monitoring was conducted for the CCR management unit in accordance with the United States Environmental Protection Agency's (USEPA) CCR Rule (40 Code of Federal Regulations (CFR) Section 257.90 through Section 257.95). Detection and Assessment groundwater monitoring are complete at the Reid/HMP&L Station Surface Impoundment, and one constituent of concern (COC), lithium (Li), has been identified based on exceedance of the applicable Groundwater Protection Standard (GWPS) at a statistically significant level (SSL).

Section 257.96(c) requires this assessment to include an analysis of the effectiveness of potential corrective measures in meeting the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

- (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).

Several potential corrective measures technologies were evaluated to identify which ones could be carried forward as components of corrective measures alternatives. The results of the corrective measures technology evaluation are presented below:

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as standalone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established CAOs.
Institutional Controls (ICs)	Retained as supplement to corrective measures alternatives	The use of ICs (i.e., Environmental Covenants, groundwater use restrictions, etc.) is retained as a useful technology. However, it is noted the ICs are not anticipated to be used as a stand-alone technology. Environmental Covenants, groundwater use restrictions, etc., are expected to be combined with other applicable technologies as part of corrective measures alternatives.

Reid/HMP&L Station Surface Impoundment
 Assessment of Corrective Measures

Groundwater Monitoring (Assessment and Detection modes)	Retained as supplement to corrective measures alternatives	The use of groundwater monitoring (Assessment and/or Detection modes as appropriate) when combined with other applicable technologies as part of any proposed corrective measures alternative is retained to address the CAO and to track the effectiveness of the overall remedy. However, it is not retained as a stand-alone technology.
Hydraulic Containment	Retained	The use of hydraulic containment is retained because it is an effective means of preventing off-site migration of soluble contaminants. Hydraulic containment requires management and potential ex-situ treatment of extracted groundwater, so it is not a stand-alone technology. The Conceptual Site Model (CSM) will guide the design of any groundwater extraction system to optimize the total discharge of groundwater needed to provide hydraulic containment.
Physical Containment	Retained	The use of physical containment is retained because it can be an effective means of managing groundwater flow. Physical containment often requires pairing with hydraulic containment and/or in-situ treatment (funnel and gate style) to manage the flux of groundwater flow into the system. The CSM will guide the design of any physical barrier system, but technology limitations may increase implementation difficulty with scale.
Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment technologies are retained as a way of removing contaminants from extracted groundwater from a hydraulic containment system. Ex-situ treatment may be paired with wastewater treatment, non-groundwater release treatment systems, or with permitted discharge to manage groundwater contamination. The CSM and data gaps investigations will guide the design of any ex-situ treatment.
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment
Other Source Control Technologies	Retained	Control of source area non-groundwater related releases. For the purposes of this groundwater ACM, management of non-groundwater releases are not included in the alternatives evaluation. Engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods are regarded as part of closure technologies selected by other means.

Note: Technologies that were retained may be used as components of a corrective action alternative, but when evaluated in conjunction with other available technologies, any single technology may not be utilized.

Preliminary assembly of corrective measures alternatives was performed based on site-specific and regional geology and groundwater conditions. For the Reid/HMP&L Station Surface Impoundment, five corrective measures alternatives were developed from this list of applicable corrective measures technologies:

- Alternative #1 – No Action, and Groundwater Monitoring
- Alternative #2a – Closure in Place (CiP), Institutional Controls (ICs), and Groundwater Monitoring

- Alternative #2b – Closure by Removal (CbR), ICs, and Groundwater Monitoring
- Alternative #3 – CiP, ICs, Hydraulic Containment, Other Source Control, Ex-Situ Treatment, and Groundwater Monitoring
- Alternative #4 – CiP, ICs, Physical Containment, Ex-Situ Treatment, and Groundwater Monitoring

The assembly of corrective measures alternatives is preliminary and could be revised at a later date following detailed analysis during the remedy selection process and/or following comment from the regulatory community and public. Specifically, a public meeting is required under Section 257.96(e) at least 30 days prior to the selection of remedy so that the owner or operator may discuss the results of the corrective measures assessment with interested and affected parties.

Following submittal of the ACM, the Site will begin the remedy selection process that is set forth in Section 257.97. The selected remedy must:

- Meet the requirements of Section 257.97(b) of the CCR Rule;
- Consider the standards in Section 257.97(c), and;
- Address the schedule and other factors specified in Section 257.97(d).

Upon remedy selection, a remedy selection report will be prepared that documents details of the selected remedy and how the selected remedy meets Section 257.97 requirements. As needed to accommodate further investigation(s) and/or evaluation, Section 257.97 requires the preparation of a semiannual report that documents progress toward remedy selection and design.

1.0 INTRODUCTION

The following report presents the Assessment of Corrective Measures (ACM) for groundwater impact identified at the Reid/HMP&L Station CCR Surface Impoundment (Reid/HMP&L Station Surface Impoundment), which is a coal combustion residuals (CCR) management unit located at the Big Rivers Electric Corporation (BREC) at the Sebree Generating Station (Sebree Station), located near Sebree, Kentucky (Site).

Groundwater monitoring was conducted for the unit in accordance with the United States Environmental Protection Agency's (USEPA) CCR Rule (40 Code of Federal Regulations [CFR] Section 257.90 through Section 257.95). The results of Detection Monitoring (per Section 257.94) identified the presence of one or more indicator constituents (Appendix III to Section 257) with downgradient concentrations representing a statistically significant increase(s) (SSI) over background or upgradient conditions. The detection of one or more SSI required the implementation of Assessment Monitoring following the requirements of Section 257.95, which was initiated in April 2018. Assessment Monitoring results indicated the downgradient presence of one or more constituents of concern [COCs] (Appendix IV to Section 257) at concentrations that represent an SSI over background concentration, and that represent a statistically significant level (SSL) over the groundwater protection standard(s) established in accordance with to Section 257.95(h).

For the Reid/HMP&L Station Surface Impoundment unit, the following SSL was identified:

- Lithium (Li) in MW-10

The identification of the SSL requires characterization of the nature and extent of impact (sufficient to support the ACM) in accordance with Section 257.95(g)(1) and the initiation of an ACM following the requirements of Section 257.96. Notice of ACM initiation dated January 14, 2019 was posted to BREC's publicly-accessible CCR reporting website.

Section 257.96(c) requires this ACM to include an analysis of the effectiveness of potential corrective measures in meeting the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

- (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).

This report presents the ACM evaluation in the following five sections, along with their associated appendices and attachments.

2.0 DESCRIPTION OF CURRENT CONDITIONS

This section provides information related to the current use of the site, as well as the history of activities relevant to the ACM for the Reid/HMP&L Station Surface Impoundment at the Sebree Station.

2.1 Site Background

BREC owns and operates the Sebree Station, which is a coal-fired power generating facility located on the Green River northeast of Sebree, Kentucky. Sebree Station is composed of Green Station and Reid/HMP&L Station. The Sebree Station is bounded by Interstate-69 to the west and the Green River to the east (see **Figure 1**). Reid Unit 1 (66 Megawatts) began commercial operation in 1966 and it will be converted from coal to natural gas in the future. The Reid Combustion Turbine (72 MW) was commercialized in 1976. HMP&L Station 2, Units 1 (167 MW) and 2 (168 MW) began commercial operation in 1973 and 1974 respectively. Both HMP&L units were retired as of February 1, 2019. Green Station Units 1 (242 MW) and 2 (242 MW) began commercial operation in 1979 and 1981, respectively.

The location of the Reid/HMP&L Station Surface Impoundment is illustrated in **Figure 2**. The CCR Surface Impoundment has been in place for more than 40 years and is used for the placement of CCR material. As stated in the published CCR monitoring well network certification, available on the BREC website, the Reid/HMP&L Station Surface Impoundment is a combined incised/dike earthen embankment structure. It is diked on the west, south and east sides, while the north side is incised. The south dike has the greatest height, reaching approximately 20 feet. The original ground surface within the pond footprint was irregular and the dominant features were small stream valleys draining eastward to the Green River. Most of the central portion of the south dike was constructed on a subdued ridge.

2.2 Site Investigation and Interim Measures

Monitoring wells were installed in the vicinity of the Reid/HMP&L Station Surface Impoundment in December 2015 prior to the implementation of the CCR Rule. These wells meet the requirements of §257.90 of the CCR Rule for installation of a groundwater monitoring system. These requirements are that wells must adequately represent the quality of background groundwater and groundwater representing the downgradient waste boundary. The wells are located along the perimeter of the footprint for the Reid/HMP&L Station Surface Impoundment. One upgradient monitoring well (MW-7) and three downgradient monitoring wells (MW-8, MW-9, and MW-10) were installed adjacent to the Reid/HMP&L Station Surface Impoundment to determine the general direction of groundwater movement and to monitor groundwater at the Site. The monitoring wells were installed in the uppermost saturated portion of the sandstone bedrock aquifer.

Hydraulic testing (slug tests) was performed in April 2019, and nine rounds of Baseline groundwater sampling for Appendix III constituents was conducted between March 2016 and October 2017. Statistical evaluation for Detection monitoring indicated that SSIs over background have occurred, and therefore, Assessment monitoring was triggered. Detection monitoring activities and data are presented in the annual reports that have been prepared to date, (AECOM 2018 and 2019. Annual Groundwater Monitoring).

As part of Assessment monitoring, upgradient and downgradient wells for the CCR Surface Impoundment were sampled for Appendix IV constituents in April, July, and September 2018. GWPSs were established for Assessment monitoring of the Appendix IV constituents, and statistical evaluation indicated exceedances of GWPSs at SSLs.

For the purposes of this ACM, the COC that exceeds GWPSs at SSLs is Li (see **Table 1**).

Table 1 – Reid/HMP&L Station Surface Impoundment Constituents of Concern (COCs)

Monitoring Well (Date)	Parameter
	Lithium UPL 0.008 GWPS 0.04 (mg/L)
MW-10 (Apr 2018)	0.694
MW-10 (Jul 2018)	0.630
MW-10 (Sep 2018)	0.570

NOTES:

GWPSs are the greater of the site-specific background concentrations, the USEPA primary drinking water standard maximum contaminant limits (MCL), or GWPS provided in 40 CFR 257.95(3)(h)(2)

Bold red values exceed the GWPS by direct comparison; yellow shaded indicates an SSL above the GWPS (i.e., 95 LCL > GWPS) UPL = Upper Prediction Limit; mg/L = milligrams per liter; < = constituent concentration is less than laboratory reporting limit.

No formal interim corrective measures have been performed at the Reid/HMP&L Station Surface Impoundment but waste is no longer placed in the unit and closure activities have been initiated.

2.3 Conceptual Site Model (CSM)

The main purpose of a CSM is to support the decision-making process for groundwater corrective action at the Reid/HMP&L Station Surface Impoundment.

2.3.1 Physical Setting

The Site is mapped within the Interior Low Plateaus physiographic province (<https://www.nps.gov/subjects/geology/physiographic-provinces.htm>). The province is part of the Interior Plains division of the United States. Characteristic features of the province include unglaciated rolling limestone plains with alluvial valleys and entrenched rivers and streams. Several large rivers are in the region, including the Green, the Ohio, the Kentucky, the Tennessee, and the Cumberland Rivers. The geology underlying the Site consists of unconsolidated materials, including loess and alluvial deposits, underlain by Upper to Middle Pennsylvanian-age clastics and carbonates consisting primarily of sandstone and shale. The unconsolidated material also include fill, silty and clayey residuum, and minor amounts of sandy, clayey channel fill alluvium.

The Reid/HMP&L Station Surface Impoundment is located on upland adjacent to the west bank of the Green River at an elevation of approximately 389 feet, above mean sea level [ft., amsl] (at the west corner) and 400 ft., amsl (at the northeast corner). Although the Green River is located less than 0.5 miles from the site, the structure does not extend significantly into the floodplain. Underlying preconstruction soils consisted of Loring-Grenada, Loring-Zanesville-Wellston (Henderson County) and Loring-Wellston-Zanesville (Webster County) soil associations which are generally characterized as well drained to moderately well drained soils on nearly level to sloping uplands (Associated Engineers 2016, Hydrologic and Hydraulic Capacity Assessment and Initial Inflow Design Flood Control System Plan). The immediate watershed that drains to the unit, and in which the unit is considered to be located, is unnamed and 25.45 acres in size. The unnamed watershed discharges from the Reid/HMP&L Station Surface Impoundment outflow structure and is routed, under a Kentucky Pollution Discharge and Elimination System (KPDES) permit, to the Green River.

2.3.2 Geology

Figure 3 presents a geologic map of the site and vicinity. The site lies in the Western Kentucky Coalfields, characterized by rolling uplands underlain by coal-bearing bedrock of the Pennsylvanian Period. In the vicinity of the site, maximum topographic relief is on the order of 80 feet. The geologic quadrangle (Geologic map of the Robards quadrangle, Henderson and Webster Counties, Kentucky, 1973) for the Site vicinity published by the Kentucky Geological Survey (KGS) shows the surficial material to be unconsolidated loess representing the Pleistocene and Holocene geologic epoch. The loess consists of sandy and clayey silt. The unconsolidated surficial materials, which include silty and sandy clay units, are approximately 25 feet in thickness.

The unconsolidated surficial materials are underlain by bedrock of the Upper Pennsylvanian Shelburn Formation (formerly identified as the Lisman Formation [Fairer, 1973]) and the Middle Pennsylvanian Carbondale Formation. At the base of the Shelburn Formation is the Providence Limestone Member, consisting of limestone and interbedded shale, but this unit is absent in much of the area due to erosional channeling. Due to its discontinuous character and the presence of interbedded shale, hydrologically significant karst features are not present in the Providence Limestone Member. The underlying Carbondale Formation consists of cyclic sequences of sandstones, shales, siltstones and coals. The Carbondale sediments were deposited in a fluvial-deltaic system. As a result of this depositional environment, the lithologic units of the Carbondale tend to be lenticular bodies rather than continuous sheet-like strata. Gradational and abrupt horizontal changes in lithology are often encountered.

Cross-sections were prepared during development of this ACM, and cross-section locations are shown on **Figure 2**. The individual cross-sections are presented on **Figures 4** and **5**. These sections illustrate the sequence of geologic units present under the Reid/HMP&L Station Surface Impoundment as evidenced by the currently available data.

2.3.3 Hydrogeology

For purposes of compliance with the CCR Rule groundwater monitoring requirements, the interbedded sandstone and shale of the Carbondale Formation is considered to be the uppermost aquifer underlying the Reid/HMP&L Station Surface Impoundment. The uppermost aquifer is unconfined and first encountered at an elevation of approximately 413.4 ft., amsl at the northeast end (at MW-7), and 341.6 ft. amsl at the west end of the Surface Impoundment (at MW-8). Flow direction beneath the site is typically to the southwest towards an unnamed tributary to Groves Creek located west/southwest of the impoundment.

Slug tests were performed between April 24, 2019 and April 25, 2019 at monitoring wells MW-10, and MW-110 to assess the hydraulic characteristics of the uppermost aquifer. The estimated hydraulic conductivity of the monitoring wells tested ranged from 3×10^{-6} to 5×10^{-4} centimeters per second (cm/sec).

Although previous site-specific investigations have noted the presence of perched zones of saturation in the overlying unconsolidated materials, these discontinuous zones do not qualify as an uppermost aquifer under the CCR Rule because they do not produce usable quantities of groundwater.

2.3.4 Constituents of Concern (COCs)

As described in Section 2.2, a single Appendix IV constituent, Li, was detected at concentrations exceeding GWPS at one monitoring well location: Li was detected at SSLs above the GWPS at the monitoring well MW-10 location.

2.3.5 Impacted Media

Groundwater is the sole impacted media of concern addressed by this ACM.

2.3.6 COCs Distribution

Groundwater analytical data from the site investigations through 2018 indicate that COC concentrations above GWPSs are present in the vicinity of the Reid/HMP&L Station Surface Impoundment along the southwest edge (**Figure 6**). COC concentrations at MW-7, MW-8, and MW-9 were not above GWPSs at SSLs. Due to this, the area of projected corrective measures is confined to the area at and adjacent to MW-10.

An additional characterization well, MW-110, was subsequently installed to estimate the downgradient extent of impacted groundwater. Sample collection for Appendix III and IV parameters took place in March and April 2019. The analytical results for Li were below the GWPS. The characterization data are summarized in **Table 2**.

Table 2 – Reid/HMP&L Station Surface Impoundment Characterization Sample Results

Monitoring Well (Date)	Parameter
	Lithium UPL 0.008 GWPS 0.04 (mg/L)
MW-110 (March 2019)	0.0299
MW-110 (April 2019)	0.0303

The two sampling event results from the characterization well helps confirm the downgradient (southwestern) extent of COC impacts above the GWPS at the Reid/HMP&L Station Surface Impoundment.

2.3.7 Groundwater Quality

In addition to the presence of COCs above GWPSs, other geochemical characteristics of the uppermost aquifer consist of the following:

- The temperature of the samples taken at the downgradient wells during the September 2018 sampling event ranged from 18.53 degrees Celsius (°C) to 18.62 °C.
- Specific conductance ranged from 0.534 to 2.64 microSiemens (µS/cm).
- Dissolved Oxygen (DO) concentration ranged from 0.41 to 0.44 mg/L.
- Oxidation Reduction Potential (ORP) ranged from -74 to -95 milliVolts (mV).
- The pH of the samples ranged from 6.69 to 8.98.
- Total Dissolved Solids (TDS) concentration of the samples ranged from 293 to 1,990 mg/L.

2.3.8 Potential Receptors / Pathways

Contact with water (e.g., shallow groundwater or surface water) impacted by COCs at levels above GWPS is regarded as the potential pathway for exposure of potential receptors. Based on data published by KGS, there are no known groundwater wells used for drinking water within a 1-mile radius of the Reid/HMP&L Station, thus limiting the potential receptors to the surface water, i.e., tributaries to the Green River. The pathways to these receptors include seepage of water from the Reid/HMP&L Station Surface Impoundment through manmade and natural hydraulic barriers.

Other potential exposure pathways (e.g., soil or vapor) are not considered complete as the CCR material is isolated in the unit. This isolation prevents direct access by individuals that might result in direct contact or ingestion. In addition, the inherent non-volatile nature of the unit-specific COCs eliminates the potential for a complete vapor pathway (i.e., vapor intrusion to indoor air). Therefore, soil and vapor pathways will not be considered within the context of this ACM.

3.0 Corrective Action Objective (CAO)

For CCR units, 40 CFR Parts 257.90 through 257.98 outlines the groundwater monitoring programs (Detection and Assessment) and the corrective action evaluation process, which provide the basis for the development of the site-specific CAO. Detection and Assessment groundwater monitoring are complete at the Reid/HMP&L Station Surface Impoundment, and the COC Li has been identified based on exceedance of the GWPS.

Section 257.96(c) requires this assessment to include an analysis of the effectiveness of potential corrective measures to meet the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

- (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 subsequent remedy selection process will evaluate the following objectives for remedies, as required under Section 257.97(b):

- Protect human health and the environment;
- Attain the COC-specific GWPS as specified pursuant to Section 257.95(h);
- Control the source(s) of releases to reduce or eliminate, to the maximum extent feasible, further releases of Appendix III and IV constituents into the environment;
- Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, considering factors such as avoiding inappropriate disturbance of sensitive ecosystems (applicable to material releases only); and
- Comply with standards for management of wastes as specified in Section 257.98(d).

Together, these requirements comprise the site-specific CAO that will be used during the remedy selection process.

4.0 TECHNOLOGY IDENTIFICATION AND SCREENING

As required under Section 257.97(b), source control is one element of the CAO that is intended to prevent further releases from the source, i.e., the Reid/HMP&L Surface Impoundment. In adherence with the BREC's permit conditions, the Site will continue to operate through the end of its life cycle and will be closed in accordance with the requirements of the permit. Source control through pond closure will include installation of final cover that will prevent infiltration and contribute to groundwater quality restoration.

The identification and screening of potentially applicable corrective measures technologies for groundwater downgradient of the Reid/HMP&L Surface Impoundment is presented in **Appendix A** to this report. The findings of that screening are summarized in the table below.

Table 3 – Potential Corrective Measures Options Technology Description/Overview

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as standalone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established CAOs.
Institutional Controls (ICs)	Retained as supplement to corrective measures alternatives	The use of ICs (i.e., Environmental Covenants, groundwater use restrictions, etc.) is retained as a useful technology. However, it is noted the ICs are not anticipated to be used as a stand-alone technology. Environmental Covenants, groundwater use restrictions, etc., are expected to be combined with other applicable technologies as part of corrective measures alternatives.
Groundwater Monitoring (Assessment and Detection modes)	Retained as supplement to corrective measures alternatives	The use of groundwater monitoring (Assessment and/or Detection modes as appropriate) when combined with other applicable technologies as part of any proposed corrective measures alternative is retained to address the CAO and to track the effectiveness of the overall remedy. However, it is not retained as a stand-alone technology.
Hydraulic Containment	Retained	The use of hydraulic containment is retained because it is an effective means of preventing off-site migration of soluble contaminants. Hydraulic containment requires management and potential ex-situ treatment of extracted groundwater, so it is not a stand-alone technology. The CSM will guide the design of any groundwater extraction system to optimize the total discharge of groundwater needed to provide hydraulic containment.

Reid/HMP&L Station Surface Impoundment
 Assessment of Corrective Measures

Potentially Applicable Technology	Status	Description/Overview
Physical Containment	Retained	The use of physical containment is retained because it can be an effective means of managing groundwater flow. Physical containment often requires pairing with hydraulic containment and/or in-situ treatment (funnel and gate style) to manage the flux of groundwater flow into the system. The CSM will guide the design of any physical barrier system, but technology limitations may increase implementation difficulty with scale.
Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment technologies are retained as a way of removing contaminants from extracted groundwater from a hydraulic containment system. Ex-situ treatment may be paired with wastewater treatment, non-groundwater release treatment systems, or with permitted discharge to manage groundwater contamination. The CSM and data gaps investigations will guide the design of any ex-situ treatment.
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.
Other Source Control Technologies	Retained	Control of source area non-groundwater related releases. For the purposes of this groundwater ACM, management of non-groundwater releases are not included in the alternatives evaluation. Engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods are regarded as part of closure technologies selected by other means.

References: Technology descriptions referenced from 1) FRTR: Federal Remediation Technologies Roundtable, CLU-IN, and/or AECOM reference materials.

5.0 Corrective Action Alternatives Assembly

Applicable corrective measures technologies identified in Section 4.0 above were assembled into corrective measures alternatives for evaluation (see Section 6.0). Each corrective measures alternative consists of one or more corrective measures technologies assembled into a strategy for the groundwater remedy. Five corrective measures alternatives for the Reid/HMP&L Station Surface Impoundment were assembled and are described below:

- **Alternative #1** – No Action, and Groundwater Monitoring
- **Alternative #2a** – Closure in Place (CiP), Institutional Controls (ICs), and Groundwater Monitoring
- **Alternative #2b** – Closure by Removal (CbR), ICs, and Groundwater Monitoring
- **Alternative #3** – CiP, ICs, Hydraulic Containment, Other Source Control, Ex-Situ Treatment, and Groundwater Monitoring
- **Alternative #4** – CiP, ICs, Physical Containment, Ex-Situ Treatment, and Groundwater Monitoring

5.1 Assumptions for Corrective Measure Alternatives Development

In developing the corrective measures alternatives, a number of assumptions have been made based on the data available to AECOM at the time of this report and operational plans as reported by the owner/operator. The specific assumptions include:

- The currently observed dissolved-phase groundwater impacts are limited to the area adjacent to monitoring well location MW-10 along the southeastern corner of the Reid/HMP&L Station Surface Impoundment; groundwater impacts do not extend offsite from the Sebree Station property.
- Groundwater impacts are limited to the saturated zone between the observed water table at approximate elevation 390 feet mean sea level (ft-msl) and an assumed depth below the MW-10 well screen of approximately 325 ft-msl.
- Ex-situ treatment of groundwater may involve physical/chemical methods and/or discharge to a permitted National Pollution Discharge and Elimination System (NPDES) outfall.
- Groundwater corrective measures will be conducted until the CAOs are met. The objectives may be met at an earlier date, but the alternatives analysis is based on the conservative assumption that corrective measures and the associated monitoring of groundwater conditions will be required for up to 30 years following the initiation of the corrective measures.

5.2 Groundwater Corrective Measures Alternatives Overview

The developed groundwater corrective measures alternatives, outlined above, are detailed in the following sections.

5.2.1 Alternative #1 – No Action and Groundwater Monitoring

Alternative #1 consists of taking no action to remedy the CCR impacts observed in the Reid/HMP&L Station Surface Impoundment groundwater monitoring system. Under the No Action alternative, no corrective measures would be implemented to remove, control, mitigate, or minimize exposure to

impacted groundwater. Groundwater monitoring (Assessment) is required by the CCR Rule during the nominal performance period of 30 years to track the effectiveness of the alternative and to identify conditions that allow the return to Detection monitoring. The No Action alternative establishes a baseline, or reference point against which each of the developed corrective measures alternatives may be compared.

5.2.2 Alternative #2a – CiP, ICs, and Groundwater Monitoring

Alternative #2a employs a combination of three of the retained corrective measures technologies:

- CiP source control, which consists of planned Reid/HMP&L Station Surface Impoundment closure activities;
- Implementation of ICs designed to restrict the property to industrial use and to prohibit groundwater use for potable purposes; and
- Groundwater Monitoring (Assessment) to track the effectiveness of the corrective measures and to identify conditions that allow the return to Detection monitoring and ultimately to cessation of corrective measures.

CiP was selected as the source control technology because the site's operational planning includes closure-related activities that will eventually result in placement of an engineered cap. CiP via CCR stabilization and capping would serve to control the source of constituents of concern (COCs) and thereby reduce contaminant loading to the surrounding environment.

Implementation of ICs is employed to help maintain the CiP and associated corrective measures by limiting the accessibility of the unit to unauthorized users and restricting future use of the property to those activities that may result in exposure potentials.

Groundwater monitoring of the unit is required by 40 CFR Section 257.90 through .98. The unit triggered Assessment-mode monitoring by the detection of indicator parameters (Appendix III of 40 CFR 257) in downgradient monitoring wells at concentrations representing a SSI over background. Continued groundwater monitoring is required under 40 CFR 257.95 until the CAOs are met. The CAOs are anticipated to be met as the effect of source control technologies are realized and as natural attenuation mechanisms (advection, dilution and dispersion) take effect.

5.2.3 Alternative #2b – CbR, ICs, and Groundwater Monitoring

Alternative #2b is similar to Alternative #2a except that CiP is replaced by CbR, which consists of excavation and removal of the Reid/HMP&L Station Surface Impoundment, implementation of ICs and an Environmental Covenant intended to restrict the unit to industrial use and prohibit groundwater use for potable purposes. The excavation of impacted CCR material would typically be completed using standard construction equipment (e.g., backhoe, excavator, wheel loader, dump trucks). The excavated materials are then placed directly into dump trucks for transport/disposal or beneficial use. Excavation limits would typically be verified with confirmation sampling to demonstrate that the underlying soil is not impacted above applicable standards.

Groundwater monitoring of the unit is required by 40 CFR 257.90 through .98. The unit triggered Assessment-mode monitoring by the detection of indicator parameters (Appendix III of 40 CFR 257) in downgradient monitoring wells at concentrations representing a SSI over background. Continued groundwater monitoring is required under 40 CFR 257.95 until the CAOs are met. The CAOs are

anticipated to be met as the effect of source control technologies are realized and as natural attenuation mechanisms (advection, dilution and dispersion) take effect.

5.2.4 Alternative #3 – CiP, Hydraulic Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring

Alternative #3 builds on Alternative #2a to also include the addition of Hydraulic Containment and Ex-Situ Treatment of groundwater:

- CiP source control, which consists of planned Surface Impoundment closure activities;
- Implementation of ICs designed to restrict the property to industrial use and to prohibit groundwater use for potable purposes;
- Hydraulic Containment using one or more vertical wells designed to prevent the movement of impacted groundwater past the limits of the unit to the downgradient groundwater environment and potential points of exposure;
- Ex-Situ Treatment of groundwater extracted for hydraulic containment, which involves above-ground physical/chemical treatment methods and/or permitted discharge until the CAOs are achieved;
- Implementation of ICs designed to restrict the property to industrial use and to prohibit groundwater use for potable purposes; and
- Groundwater Monitoring (Assessment mode) to track the effectiveness of the corrective measures and to identify conditions that allow the return to Detection-mode monitoring and ultimately to cessation of corrective measures.

Vertical groundwater recovery wells for Hydraulic Containment would be installed near the downgradient limit of the unit in the vicinity of MW-10. Due to the low hydraulic conductivity of the uppermost aquifer, Pre-Design Studies are anticipated to be needed to identify the appropriate number, design, and spacing of the extraction well system. For the purposes of this ACM, preliminary specifications are as follows:

- Two vertical groundwater extraction wells;
- Extraction wells would be placed at the southeast corner of the Reid/HMP&L Station Surface Impoundment and upgradient of monitoring well MW-10;
- Wells screen depths would be approximately 50-100 feet-below ground surface (ft-bgs);
- Estimated groundwater extraction rates of 20 gallons per minute (gpm) per well.

Alternative #3 incorporates treatment of extracted groundwater before it can be discharged to an outfall. Treatment will consist of piping the extracted groundwater to an existing surface water impoundment at the Sebree Station, which will allow for compliance with discharge permits through an established NPDES outfall.

The COC concentrations downgradient of the hydraulic containment would also be expected to decrease over time through natural attenuation mechanisms including advection, dilution, and dispersion. As such, groundwater monitoring would be modified to include system performance monitoring, which may require installation of wells at new locations to evaluate the efficacy of hydraulic containment and to identify when CAOs have been achieved.

5.2.5 Alternative #4 – CiP, ICs, Physical Containment, Ex-Situ Treatment, and Groundwater Monitoring

Alternative #4 consists of BREC's planned unit closure activities, physical containment of impacted groundwater via installation of a funnel-gate system, and ex-situ treatment of contained groundwater via an extraction well installed at the containment gate. Impacted groundwater would be contained by grout curtain constructed in a funnel-and-gate arrangement that directs the flow of groundwater to an extraction point. The grout curtain would be installed by drilling two lines of grout injection points that extend northwestward and northeastward from the southeast corner of the unit. The length of each limb of the barrier would be 500 feet, and the target depth would be approximately 325 ft-amsl. A single extraction well would be installed at the "gate" with a screened interval of 50 to 100 ft-bgs and a pumping capacity of up to 20 gpm. Groundwater will be pumped and conveyed to an existing surface water impoundment at the Sebree Station, which will allow for compliance with discharge permits through an established NPDES outfall.

CiP via ash stabilization and capping would control the source of COCs and thereby reduce contaminant loading to the extraction system. Concentrations downgradient of the physical barrier would be expected to decrease over time through several natural attenuation mechanisms including advection, dilution, and dispersion. Groundwater Monitoring (Assessment) would continue to track the effectiveness of the corrective measures and to identify conditions that allow the return to Detection monitoring and ultimately to cessation of corrective measures.

6.0 ALTERNATIVE EVALUATION

The formal remedy selection process, in accordance with the CCR Rule 40 CFR Section 257.97, will begin following submission of the ACM Report. The subsequent remedy selection process will evaluate the following objectives for remedies, as required under Section 257.97(b):

- Protect human health and the environment;
- Attain the COC-specific GWPSs as specified pursuant to Section 257.95(h);
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents 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 (applicable to material releases only); and
- Comply with standards for management of wastes as specified in Section 257.98(d).

6.1 Potential Data Gaps

No data gap investigation is projected at this time.

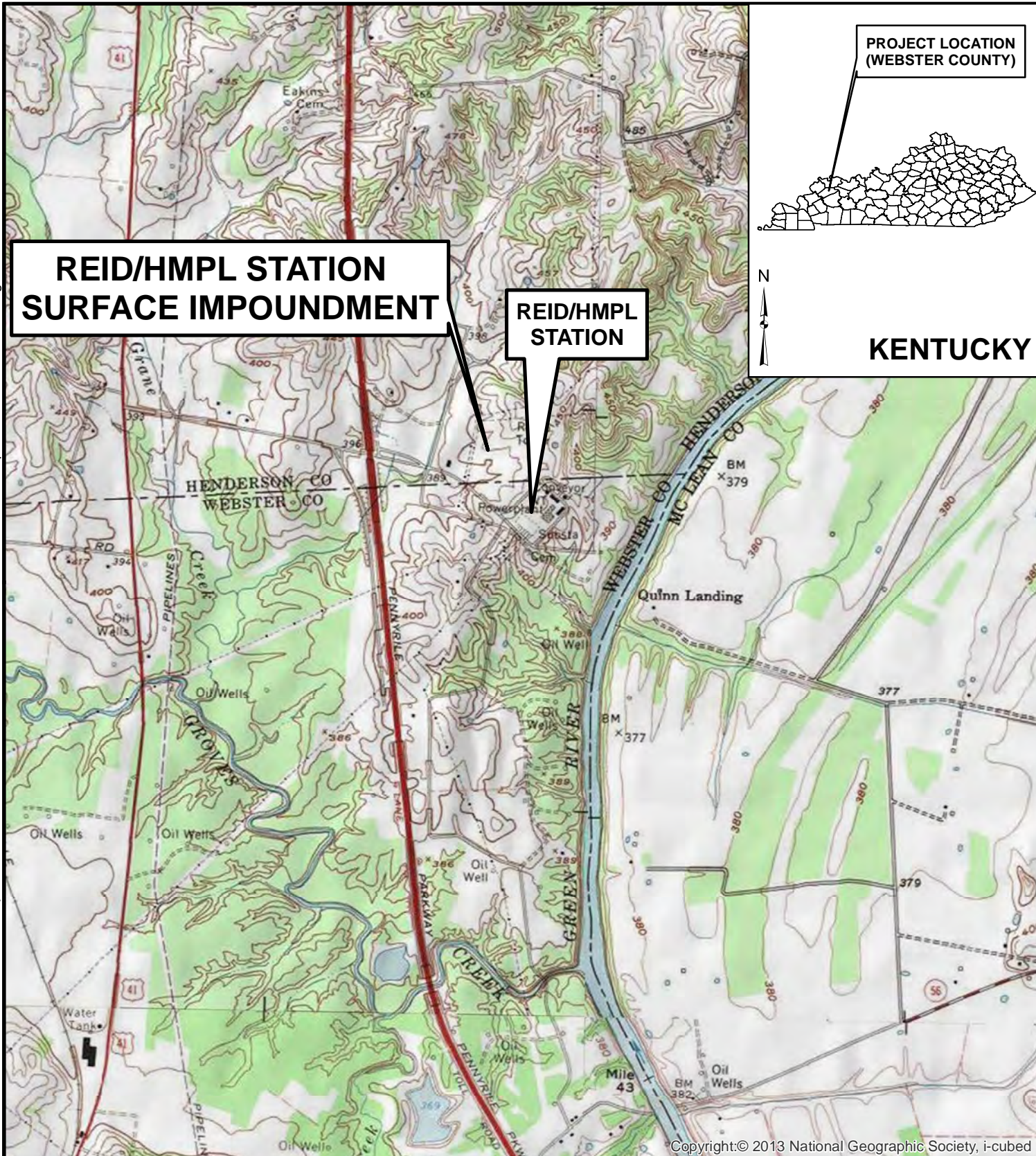
Depending on which alternative is selected, a data gap investigation may be needed to further refine the targeted areas for corrective measures,. Potential data gaps may include the following:

- 1) Supplemental Groundwater Investigation – This investigation may consist of additional monitoring well installation and sampling to refine the existing CSM as well as to provide data related to the hydraulic characteristics of the subsurface.
- 2) Groundwater Treatment Amendment Evaluation – This evaluation may involve the completion of bench-scale testing of potentially applicable treatment amendments to determine their efficacy and loading rates to address the observed groundwater impacts from site-specific COCs. Additionally, testing on the pilot-scale may also be completed in the field to demonstrate that the groundwater treatment system could be successfully installed and operated at the Site.
- 3) Physical Containment Profile – Prior to committing to a physical barrier design, it may be necessary to probe the subsurface along the proposed alignment to:
 - Establish the character of the materials through which the barrier would be installed;
 - The depth to confinement where the barrier would terminate;

7.0 REFERENCES

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- Associated Engineers 2016. Hydrologic and Hydraulic Capacity Assessment and Initial Inflow Design Flood Control System Plan.
- EPA, 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. EPA/540/G-89/004.
- EPA, 40 CFR Part 257. [EPA-HQ-RCRA-2015-0331; FRL-9928-44-OSWER]. RIN-2050-AE81. Technical Amendments to the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities—Correction of the Effective Date. Federal Register / Vol. 80, No. 127 / Thursday, July 2, 2015 / Rules and Regulations.
- Fairer, G.M., Geologic Map of the Robards Quadrangle, Henderson and Webster Counties, Kentucky, U.S. Geological Survey, 1973.

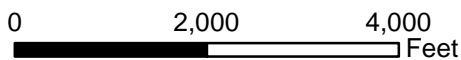
Figures



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ROBARDS QUADRANGLE
DELAWARE QUADRANGLE

(FROM ARCGIS ONLINE Copyright:© 2011 National Geographic Society, i-cubed)



Reid/HMPL Station
Webster County, Kentucky

**FIGURE 1
SITE LOCATION MAP**

DATE: 4/30/2019

SCALE: 1IN = 2,000 FEET

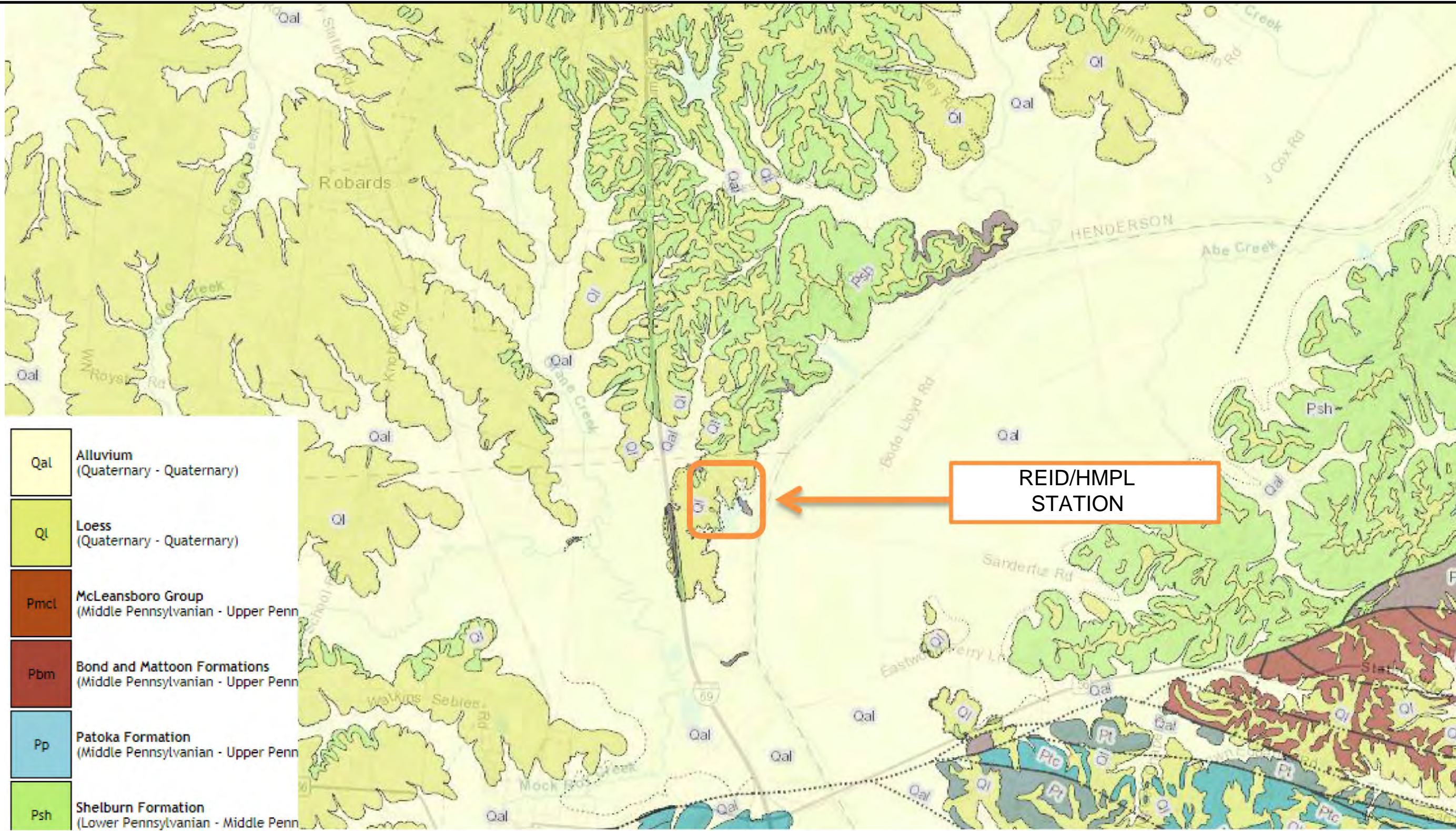
CREATED BY: ALW

JOB NO. 60602365



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

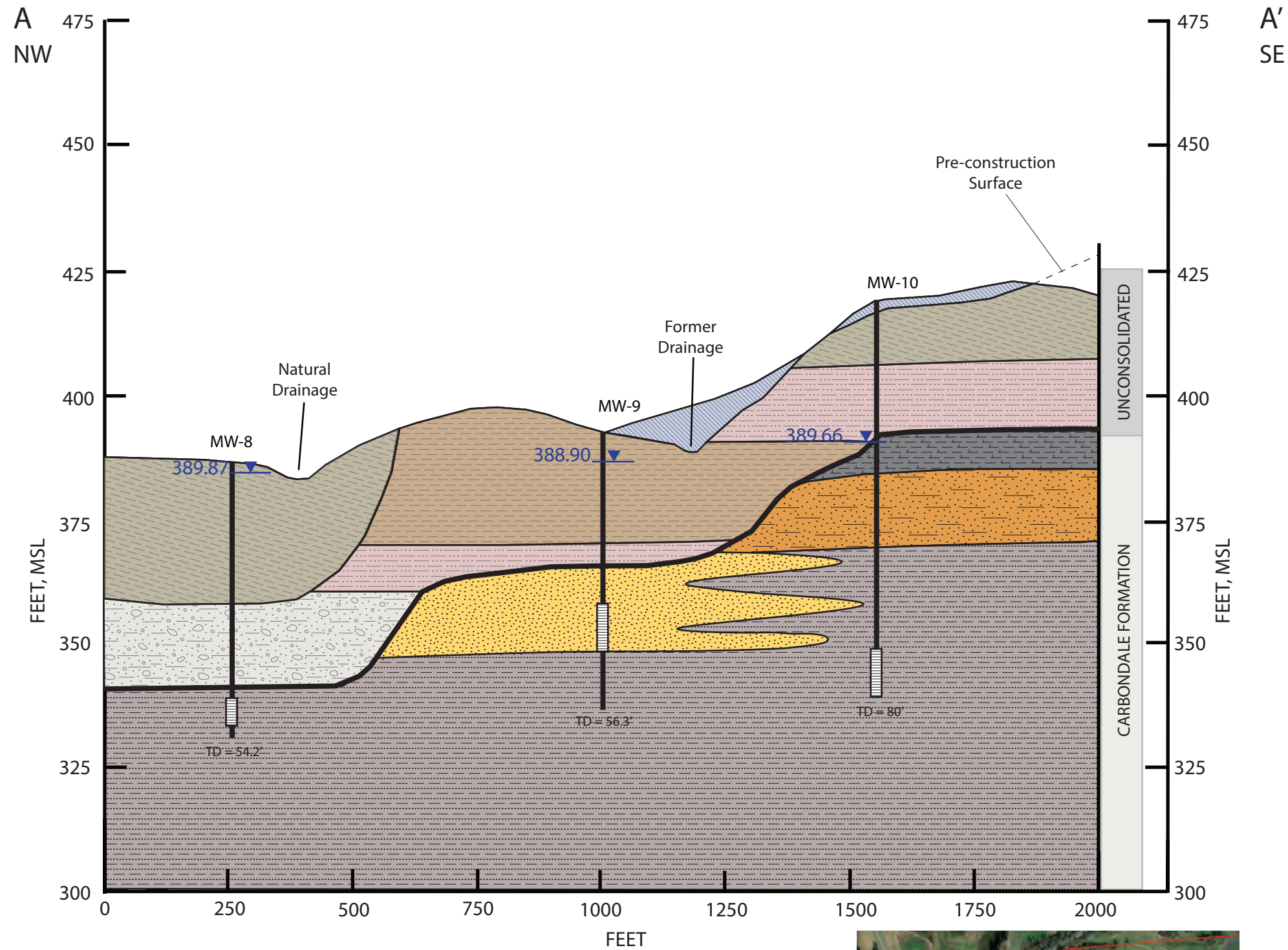
Legend Unit Boundary Property Line Downgradient CCR Monitoring Well Upgradient CCR Monitoring Well Proposed Characterization Well		A ——— A' Transect Line		 Reid/HMPL Station Webster County, Kentucky	
0 300 600 Feet				N 	
				FIGURE 2 WELL LOCATION MAP	
DATE: 5/16/2019		SCALE: 1IN = 200 FEET			
CREATED BY: ALW					
JOB NO. 60602365					



- Qal Alluvium
(Quaternary - Quaternary)
- Ql Loess
(Quaternary - Quaternary)
- Pmcl McLeansboro Group
(Middle Pennsylvanian - Upper Penn)
- Pbm Bond and Mattoon Formations
(Middle Pennsylvanian - Upper Penn)
- Pp Patoka Formation
(Middle Pennsylvanian - Upper Penn)
- Psh Shelburn Formation
(Lower Pennsylvanian - Middle Penn)

———— ROAD

Reid/HMPL Station Webster County, Kentucky	
FIGURE 3 SITE GEOLOGIC MAP (KENTUCKY GEOLOGICAL SURVEY)	
DATE: 4/30/2019	SCALE: AS SHOWN
CREATED BY: DAS	
JOB NO. 60602365	



- LEGEND
- UNCONSOLIDATED MATERIALS:
- Fill
 - Silty Clay
 - Sandy Clay
 - Clay
 - Silty Clay with Gravel

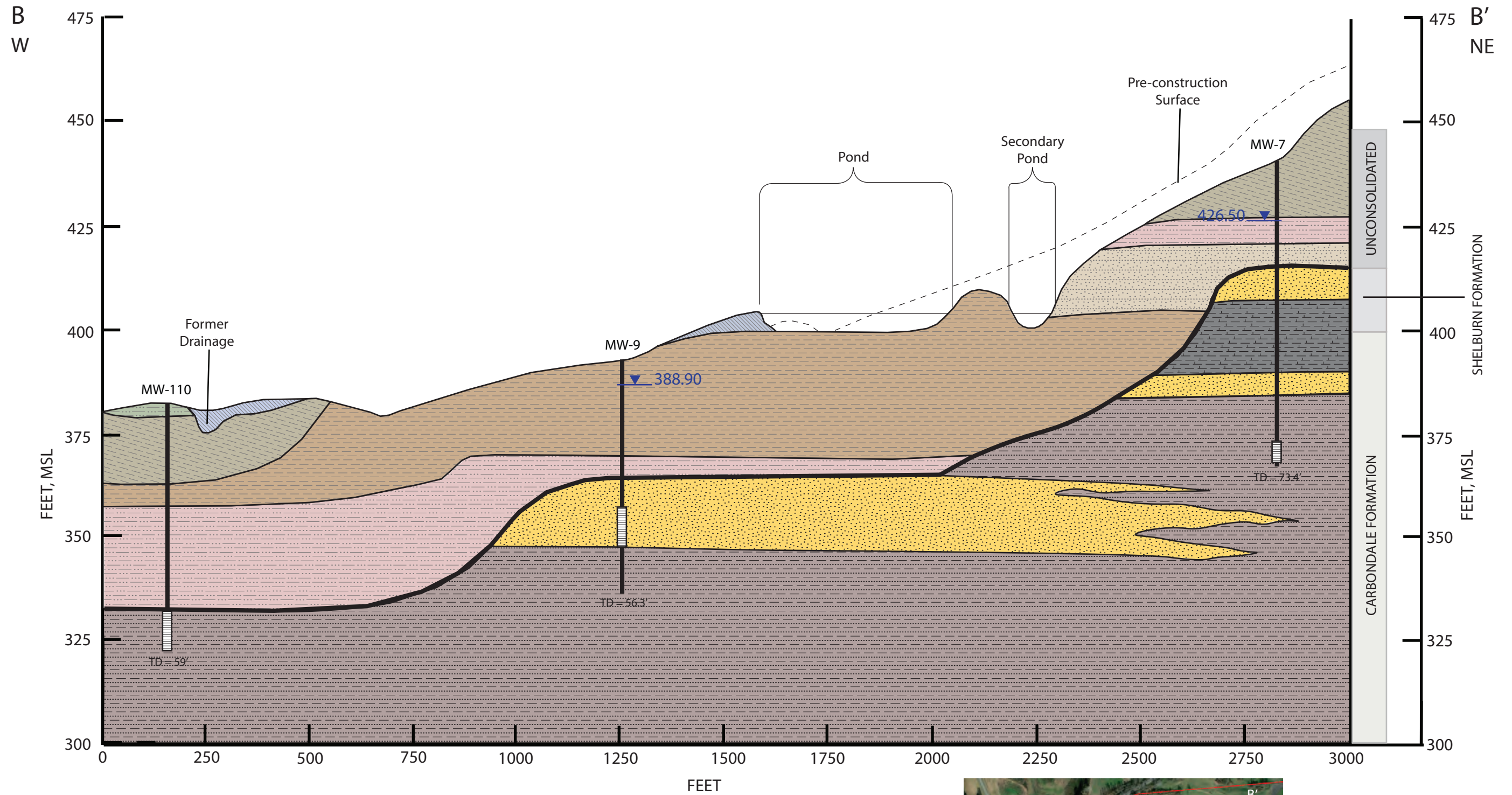
- BEDROCK LITHOLOGIES:
- Shale
 - Shaley Sandstone
 - Sandstone
 - Interbedded Sandstone and Shale

- Potentiometric Surface September 26, 2018
- MW-8 MONITORING WELL LOCATION ID
- RISER
- MONITORING WELL SCREEN
- BACKFILL / COLLAPSE

25 feet
250 feet
(Vertical Exaggeration = 10x)



FIGURE 4 CROSS SECTION A - A'	
DATE: 4/30/2019	SCALE: 1IN = 25 x 250 FEET
CREATED BY:MRH	
JOB NO. 60602365	



LEGEND

UNCONSOLIDATED MATERIALS:

- Fill
- Silt
- Silty Clay
- Silty Sand
- Clay
- Sandy Clay

BEDROCK LITHOLOGIES:

- Sandstone
- Shale
- Interbedded Sandstone and Shale

Potentiometric Surface September 26, 2018

- MW-9 MONITORING WELL LOCATION ID
- RISER
- MONITORING WELL SCREEN
- BACKFILL / COLLAPSE

25 feet
250 feet
(Vertical Exaggeration = 10x)

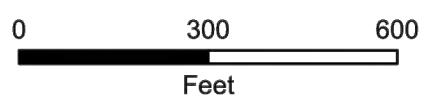


FIGURE 5 CROSS SECTION B - B'	
DATE: 4/30/2019	SCALE: 1IN = 25 x 250 FEET
CREATED BY:MRH	
JOB NO. 60602365	



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Legend**
- Unit Boundary
 - Property Line
 - ⊕ Downgradient CCR Monitoring Well
 - ⊕ Upgradient CCR Monitoring Well
 - ⊕ Proposed Characterization Well



Reid/HMPL Station Webster County, Kentucky	
FIGURE 6 COC DISTRIBUTION	
DATE: 5/16/2019	SCALE: 1IN = 200 FEET
CREATED BY: ALW	
JOB NO. 60602365	

Appendix A
Corrective Measures Technologies and
Alternatives Evaluation Process

Appendix A
Corrective Measures Technologies and
Alternatives Evaluation Process

CONTENTS

Section	Page
A1.0 CORRECTIVE MEASURES EVALUATION PROCESS.....	1
A1.1 Potential Remedial Technologies	1
A1.2 Other Source Control Technologies.....	3
A1.3 No Action.....	3
A1.4 Institutional Controls (ICs).....	4
A1.5 Groundwater Monitoring	4
A1.6 Hydraulic Containment.....	4
A1.7 Physical Containment	5
A1.8 Ex-Situ Physical/Chemical/Biological Treatment	6
A1.9 In-Situ Physical/Chemical/Biological Treatment	6
A1.10 Permeable Reactive Barriers (PRB)	6
A1.11 Closure-in-Place (CiP) [of the regulated unit]	7
A1.12 Closure by Removal (CbR) [of the regulated unit]	7
A1.13 Screened Remedial Technologies Summary	7
A2.0 CORRECTIVE MEASURES ALTERNATIVES	9

Tables

Table A1	Potential Remedial Technologies
Table A2	Screened Corrective Measures Technologies

A1.0 CORRECTIVE MEASURES EVALUATION PROCESS

This appendix describes the overall process used in the selection and screening of remedial technologies that are considered potentially applicable to Coal Combustion Residuals (CCR) groundwater impacts at the subject Site. This appendix also describes the process for assembling preliminary corrective measures alternatives from one or more applicable technologies and evaluating these alternatives.

A1.1 Potential Remedial Technologies

Section 257.96(c) requires this assessment to include an analysis of the effectiveness of potential corrective measures to meet the objectives for remedies under Section 257.97(b), addressing at least the following:

- (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 following remedial technologies are regarded as potentially applicable to corrective measures for CCR groundwater impact:

- No Action (Included as a baseline case)
- Institutional Controls (ICs)
- Groundwater Monitoring
- Hydraulic Containment
- Physical Containment
- Ex-situ Physical/Chemical/Biological Treatment
- In-situ Physical/Chemical/Biological Treatment
- Permeable Reactive Barrier (PRB)
- Closure in Place (CiP) (of the regulated unit)
- Closure by Removal (CbR) (of the regulated unit)

A brief overview of these technologies is provided below in **Table A1**.

Table A1 – Potential Remedial Technologies

Potential Technology	Description/Overview
No Action	Default baseline approach against which other options are evaluated. No corrective action would be taken to remove, control, mitigate or minimize exposure to impacted media.
Institutional Controls (ICs)	Non-engineering measures, such as administrative and/or legal controls that help to minimize the potential for human exposure to contamination, and/or to protect the integrity of a remedy by limiting land or resource use (United States Environmental Protection Agency [USEPA], <i>Institutional Control Data Standard</i> EX000015.1, January 6, 2006).
Groundwater Monitoring	Groundwater monitoring (Assessment and/or Detection modes) to assess effectiveness of corrective measures performance, as well as natural subsurface processes such as dilution, adsorption, and chemical reactions that together serve to reduce inorganic COC concentrations to acceptable levels.
Hydraulic Containment	Hydraulic containment is a common method for remediating groundwater impacted with metals and other inorganics. Groundwater is pumped from wells or collection trenches to aboveground discharge point or to a treatment system that removes the contaminants. The extraction network would be designed to provide hydraulic containment of the impacted groundwater, preventing it from flowing downgradient towards surface water or other receptors.
Physical Containment	Physical barriers are walls constructed below the ground surface to control or restrict the flow of groundwater. They are constructed by injection grouting or by the use of excavator or deep trenching equipment to insert and thoroughly mix a selected amendment to create a homogenized impermeable wall that prevents impacted groundwater from flowing downgradient. The bottom of the physical containment structure is typically keyed into a low-permeability soil or bedrock (confining layer) to keep groundwater from seeping beneath the wall. To provide hydraulic control of the impacted groundwater behind (upgradient of) the physical barrier and to prevent impacted water from flowing around the edges of the wall, extraction wells would be installed behind the vertical barrier (VB) and the extracted groundwater processed through a treatment system.
Ex-situ Physical/Chemical/Biological Treatment	Ex-situ treatment requires pumping of groundwater and engineering for equipment, possible permitting, and material handling. Physical/chemical treatment uses the physical properties of the contaminants or the contaminated medium to destroy (i.e., chemically convert), separate, or contain the contamination. Physical/chemical treatment can be completed in short time periods (in comparison with biological treatment). Equipment is readily available. Treatment residuals from separation techniques will require treatment or disposal.

Potential Technology	Description/Overview
In-situ Physical/Chemical Treatment	With in-situ treatment, groundwater is treated without being brought to the surface. In-situ processes, however, generally require longer time periods. Physical/chemical treatment uses the physical properties of the contaminants or the contaminated medium to destroy (i.e., chemically convert), or separate the contamination.
Permeable Reactive Barriers (PRB)	A PRB is a constructed subsurface barrier designed to intercept groundwater flow and react with the entrained COCs. PRBs can be established through trench injection or direct-push injection (on closely spaced grids) of reactive material. PRBs are typically installed to the depth of impacted groundwater (often the bottom of the shallow aquifer) and along the length of the impacted zone. The amendment used to generate the PRB is generally permeable as or more permeable than the surrounding material, encouraging impacted groundwater to flow through the reactive material. The reactive material then causes chemical reactions to occur, resulting in adsorption, precipitation, or degradation of the COC. PRBs are commonly used to control organic contamination in groundwater and have been successfully used to remediate metals.
Closure in Place (CiP) (of the regulated unit)	Landfill caps can be installed to minimize generation of leachate and to minimize infiltration into underlying waste. Landfill caps also may be applied to waste masses that are so large that other treatment is impractical. By providing a suitable base for the establishment of vegetation. In conjunction with water diversion and detention structures, landfill caps may be designed to route surface water away from the waste area while minimizing erosion.
Closure by Removal (CbR) (of the regulated unit)	Removal of contaminated media for disposal in off-site facility or alternate on-site facility. Media would likely require characterization for proper disposal. Pre-treatment may be necessary to meet land disposal restrictions (LDRs). Once excavated, confirmatory samples would be collected to verify clean-up criteria have been met; the excavation would then be backfilled and covered.

References: Technology descriptions referenced from 1) FRTR: Federal Remediation Technologies Roundtable, CLU-IN, and/or AECOM reference materials.

A1.2 Other Source Control Technologies

In addition to the groundwater corrective measures technologies summarized above, CCR impacts are also mitigated through a variety of engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods for source control.

A1.3 No Action

No Action is included in the evaluation as a baseline against which other technologies are evaluated. With this option, no corrective action would be taken to remove, control, mitigate or minimize exposure to impacted media. In the event that the other identified alternatives do not offer substantial benefits, No Action is the default baseline approach.

Under this alternative, existing impacted media (i.e., CCR materials and impacted soil/groundwater along the exposure pathway) would remain. No capital costs would be incurred, and no cleanup standards would be considered.

No Action does not meet the performance requirement of attaining the established Corrective Action Objective (CAO). Although implementation would be very easy, the required state approval for "No Action" would likely not occur. Safety impacts, cross-media impacts, and residual CCR exposure control

would be no different from current conditions. Therefore, No Action is not an appropriate standalone technology. However, it is retained for use as a baseline against which other technologies and alternatives are evaluated.

A1.4 Institutional Controls (ICs)

The potential use of ICs is considered the least aggressive corrective action technology for CCR impacts.

ICs would not change the concentration or mobility of COCs and therefore would not meet the performance requirement of attaining the established CAO as a standalone technology unless it can be demonstrated that impacted groundwater is not leaving the facility. ICs would be used in combination with other corrective measures to limit human exposures and would be easy to implement, consisting of preparation and recording of Environmental Restrictive Covenants [ERC(s)]. Safety impacts and cross-media impacts would be identical to current conditions. Because ICs would control exposure and thus enhance protection of human health and the environment, the use of ICs can be a component of corrective measures alternatives. The use of ICs as a standalone technology will not be considered.

A1.5 Groundwater Monitoring

The use of groundwater monitoring is only applicable for dissolved-phase groundwater impacts, and it will take place in Assessment and/or Detection modes as appropriate for the current phase of CCR activity. Groundwater monitoring is not a standalone technology, but instead will be combined with other remedial technologies in order to track progress of the overall remedy, which also incorporates natural attenuation processes.

The use of groundwater monitoring as a stand-alone remedial technology will not be considered; instead the incorporation of groundwater monitoring in conjunction with other technologies will be used to monitor effectiveness of a given corrective measures alternative to attain the CAO at points immediately downgradient over an extended period of time. Data reliability is controlled by adherence to the site's groundwater monitoring plan. Implementation of the existing groundwater monitoring plan is easy because it is currently underway. Safety impacts are minimized by use of the existing Health and Safety Plan and there are no construction activities required. There are no cross-media impacts or institutional requirements, nor is there any residual CCR exposure control.

A1.6 Hydraulic Containment

The use of hydraulic containment as a potential remedial technology is considered. The use of groundwater extraction can be effective at hydraulically controlling long-term downgradient dissolved phase impacts.

Hydraulic containment through groundwater extraction and subsequent treatment has historically been a common method for management of groundwater impacted with metals and other inorganics. Groundwater is pumped from wells (vertical or horizontal) or collection trenches to a discharge point (e.g., a permitted outfall) or to an aboveground treatment system. The extraction network would be designed, constructed and operated to provide a hydraulic barrier between the impacted groundwater and the migration pathway to potential receptors.

This technology attains the established CAO because hydraulic containment rapidly eliminates the offsite migration of impacted groundwater, thereby eliminating the exposure pathway. Performance and reliability would be controlled by adherence to the operations and maintenance plan prepared for the extraction and treatment systems. Implementation would be difficult because of areas of limited access

for drilling equipment and uneven groundwater flow in the uppermost aquifer materials that consist of interbedded sandstone and shale having hydraulic conductivity values spanning several orders of magnitude. Potential safety impacts during construction, operation, and maintenance of the system would be mitigated by health and safety plans prepared for these tasks. There would be no cross-media impacts. Hydraulic containment will reduce mobility due to COCs capture provided by the groundwater extraction system and treatment to remove COCs from the environment. The time period for CAO attainment may be relatively short, but system operation will need to continue until CCR source loading of COCs to groundwater ceases. For institutional requirements, treated discharge would occur under existing or modified National Pollution Discharge Elimination System (NPDES) permit.

Based on the preliminary screening, hydraulic containment is a potentially viable remedial technology and will be retained for further consideration.

A1.7 Physical Containment

The use of physical containment to isolate the impacted materials associated with a CCR unit is considered. Physical containment typically consists of a barrier or wall (i.e., slurry wall, sheet pile wall, or injection grouting) constructed below the ground surface to control or restrict the flow of groundwater. The barrier is typically constructed by excavators and/or deep trenching equipment that thoroughly mix bentonite/cement slurry to create a homogenized impermeable wall, or by driving sheet pile. The construction of the barrier would prevent impacted groundwater from flowing downgradient. Where possible, the bottom of the barrier would be keyed into the low-permeability soil or bedrock (confining layer) at the bottom of the aquifer, keeping groundwater from seeping beneath it. To provide hydraulic control of the impacted groundwater behind the barrier and prevent impacted water from flowing around the edges, a hydraulic containment system would be installed behind the wall. Extracted groundwater would then be discharged or processed through a groundwater treatment system, as needed. Extraction flow rates for this option will generally be lower than in a standalone hydraulic containment option, because the pumping rates will only need to accommodate natural groundwater flow rates, rather than providing a hydraulic barrier. However, pumping would need to be performed indefinitely to maintain water levels behind the barrier. It is also noted that physical barriers can also be utilized in a funnel-and-gate arrangement to direct the flow of groundwater to a small, more permeable area (i.e., the gate) where reactive material can be used to treat the metals in-situ. The "gate" can also be configured as a single extraction point for impacted groundwater directed to it by the "funnel."

This technology attains the established CAO after combined physical and hydraulic containment eliminates the offsite migration of impacted groundwater, thereby eliminating the exposure pathway. In the long term, this technology will maintain compliance with the established CAO after final cover construction at the Green Landfill, which will end the source loading to the groundwater, and groundwater flushes through the aquifer. Performance and reliability would be controlled by adherence to the operations and maintenance plan prepared for the extraction and treatment systems. The technology would pose substantial challenges to the installation and operation of the physical barrier such as areas of limited access and highly variable depths to bedrock. Potential safety impacts during construction, operation, and maintenance of the system would be mitigated by health and safety plans prepared for these tasks. Cross-media impacts include the potential for airborne fugitive dust issues during construction, which would be mitigated by construction contingency planning. The time period for attainment is based on construction of the barrier. For institutional requirements, treated discharge would occur under existing or modified National Pollution Discharge Elimination System (NPDES) permit.

Based on the preliminary screening, physical containment is potentially viable as a potential corrective measures alternative component, when combined with supplemental groundwater extraction and

treatment. However, physical containment does not appear to add value to a stand-alone hydraulic containment approach.

A1.8 Ex-Situ Physical/Chemical/Biological Treatment

Ex-situ treatment requires the use of groundwater extraction with related engineering, equipment, permitting, and material handling necessary to convey the waste stream to above-ground treatment. Treatment technologies would be designed to remove the specific constituents from groundwater to meet regulatory discharge requirements; treatment options for the varied constituents may include pH adjustment, filtration, coagulation/chemical precipitation, membrane filtration, ion exchange, carbon adsorption, reverse osmosis, chemical reduction, and other potential treatment technologies. Multiple treatment technologies would potentially be needed to effectively remove the different types of contaminants. If this technology is incorporated into a corrective action alternative, further detailed evaluation and/or bench- and pilot-scale studies would be necessary to identify technically effective treatment technologies given the inorganic COCs.

This is not a standalone technology, but would be used in combination with hydraulic containment. System reliability would be controlled by adherence to an operation and maintenance plan prepared for the system. Implementation is expected to be straightforward based on well-established water treatment principles and experience. Potential safety impacts during construction, operation, and maintenance of the system would be mitigated by health and safety plans prepared for these tasks. There would be no cross-media impacts, nor would there be exposure to residual CCR materials. The time period for attainment is based on performance of the overall corrective measure, of which ex-situ treatment would be a component. For institutional requirements, treated discharge would occur under existing or modified National Pollution Discharge Elimination System (NPDES) permit.

Based on the preliminary screening, ex-situ treatment is a potentially viable remedial technology and will be retained for further consideration.

A1.9 In-Situ Physical/Chemical/Biological Treatment

For the inorganic COCs at CCR site, in-situ treatment involves enhancement of natural attenuation processes such as dilution, adsorption, and chemical reactions to reduce concentrations to acceptable levels. This technology is appropriate for site in which groundwater flow volumes are low, source controls are effective, and impacted groundwater is not expected to be long-lived.

Lithium (Li) is the sole COC for the ACM at the Reid/HMPL Surface Impoundment, and in-situ treatment methods are ineffective for Li. Therefore, this technology will not meet the performance requirement, and it will not be retained for further consideration.

A1.10 Permeable Reactive Barriers (PRB)

A PRB is an in-situ treatment method consisting of a subsurface trench filled with reactive material installed to intercept and react with impacted groundwater. PRBs can be established through direct-push injection (on closely spaced grids) or emplaced as a continuous trench of reactive material. PRBs are typically installed to the depth of impacted groundwater (often the bottom of the shallow aquifer) and are oriented perpendicular to the flow of impacted groundwater. The amendment used to generate the PRB is generally as permeable as or more permeable than the surrounding material, encouraging impacted groundwater to flow through the reactive material. The reactive material then causes chemical reactions to occur within the PRB, resulting in adsorption, precipitation, or degradation.

PRBs are commonly used to control organic contamination in groundwater, and have been successfully used to remediate some metals. However, because Li is the sole COC for the ACM at the Reid/HMPL Surface Impoundment, and in-situ methods are ineffective for Li, PRB will not meet the performance requirement, and it will not be retained for further consideration.

A1.11 Closure-in-Place (CiP) [of the regulated unit]

CiP would entail capping and restoration of the unit that contains the CCR material. Capping would minimize infiltration into the CCR material, thereby minimizing the potential for leachate to impact underlying soil and shallow groundwater. Capping would reduce potential exposure pathways and thus enhance protection of human health and the environment.

CiP will help attain the established CAO after final cap construction ends the source loading to the groundwater, and impacted groundwater flushes through the aquifer. This technology is easily implemented, as CiP is required by conditions of the solid waste permit. Potential safety impacts during construction, operation, and maintenance of the final cover are governed by conditions of the solid waste permit and are mitigated by health and safety plans prepared for these tasks. There are no cross-media impacts associated with CiP, and it will provide for significant reduction in mobility of COCs upon implementation of the CiP source control. Final cover for the Reid/HMPL Surface Impoundment is anticipated as part of facility operations. Institutional requirements will consist of solid waste permit renewal(s) and state and community acceptance of the final remedy.

Based on the preliminary screening, CiP is retained for further consideration.

A1.12 Closure by Removal (CbR) [of the regulated unit]

CbR is a proven remedy that can effectively remove the source of contamination. The excavation of impacted CCR material would typically be completed using standard construction equipment (e.g., backhoe, excavator, wheel loader, dump trucks). The excavated materials are then placed directly into dump trucks for transport/disposal or beneficial use. Excavation limits would typically be verified with confirmation sampling to demonstrate that the underlying soil is not impacted above applicable standards.

This technology would help attain the established CAO after CCR removal ends and the source loading to groundwater is eliminated. This technology would be difficult to implement, because of the large-scale construction effort required and resulting disruption to station operations and community impact. Potential safety impacts during excavation and backfilling would be mitigated by health and safety planning. However, the volume of truck traffic for waste and fill hauling would be a significant community safety issue. Potential airborne fugitive dust issues during excavation and hauling would be significant, but would be mitigated by construction contingency planning. CbR will eliminate exposure through removal of the CCR. CbR would begin following state and community approvals, and duration of excavation activities is anticipated to be many years. In addition to state and community acceptance of the proposed remedy, excavation and backfilling may require local building permits and local municipality input and approval. Excavation dewatering discharge would occur under existing or modified NPDES permit.

Based on the preliminary screening, CbR is retained for further consideration.

A1.13 Screened Remedial Technologies Summary

A summary of the results of the remedial technologies screening is presented below in **Table A2**. The design and specific application of the retained technologies, either as stand-alone or part of a treatment train, will be crucial in the success of the corrective action.

Table A2 – Screened Corrective Measures Technologies

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as standalone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established CAOs.
Institutional Controls (ICs)	Retained as supplement to corrective measures alternatives	The use of ICs (i.e., Environmental Covenants, groundwater use restrictions, etc.) is retained as a useful technology. However, it is noted the ICs are not anticipated to be used as a stand-alone technology. Environmental Covenants, groundwater use restrictions, etc., are expected to be combined with other applicable technologies as part of corrective measures alternatives.
Groundwater Monitoring (Assessment and Detection modes)	Retained as supplement to corrective measures alternatives	The use of groundwater monitoring (Assessment and/or Detection modes as appropriate) when combined with other applicable technologies as part of any proposed corrective measures alternative is retained to address the CAO and to track the effectiveness of the overall remedy. However, it is not retained as a stand-alone technology.
Hydraulic Containment	Retained	The use of hydraulic containment is retained because it is an effective means of preventing off-site migration of soluble contaminants. Hydraulic containment requires management and potential ex-situ treatment of extracted groundwater, so it is not a stand-alone technology. The CSM will guide the design of any groundwater extraction system to optimize the total discharge of groundwater needed to provide hydraulic containment.
Physical Containment	Retained	The use of physical containment is retained because it can be an effective means of managing groundwater flow. Physical containment often requires pairing with hydraulic containment and/or in-situ treatment (funnel and gate style) to manage the flux of groundwater flow into the system. The CSM will guide the design of any physical barrier system, but technology limitations may increase the difficulty with scale.

Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment technologies are retained as a way of removing contaminants from extracted groundwater from a hydraulic containment system. Ex-situ treatment may be paired with wastewater treatment, non-groundwater release treatment systems, or with permitted discharge to manage groundwater contamination. The CSM and data gaps investigations will guide the design of any ex-situ treatment.
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.
Other Source Control Technologies	Retained	Control of source area non-groundwater related releases. For the purposes of this groundwater ACM, management of non-groundwater releases are not included in the alternatives evaluation. Engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods are regarded as part of closure technologies selected by other means.

Note: Technologies that were retained may be used as components of a corrective action alternative, but when evaluated in conjunction with other available technologies, any single technology may not be utilized.

A2.0 CORRECTIVE MEASURES ALTERNATIVES

Corrective measures technologies from the initial screening and evaluation (see **Table A2**) were utilized to create corrective measures alternatives. Professional judgment was used to assemble technically efficient pairings of technologies for each corrective measures alternative in consideration of the range of site-specific COCs and concentrations.

The corrective measures alternatives typically incorporate the use of technologies that will require additional investigation needed to 1) finalize the alternative selection, 2) delineate the assumed corrective action areas, 3) provide for full-scale cost estimation and design, and 4) demonstrate alternative efficacy. To this end, data gaps will be identified and addressed as needed.

It should be emphasized that the technology screening and alternatives assembly employed for this ACM is qualitative in nature. The formal remedy selection process, in accordance with the CCR Rule 40 CFR Section 257.97, will begin following submission of the ACM Report. The subsequent remedy selection process will evaluate the following objectives for remedies, as required under Section 257.97(b):

- Protect human health and the environment;
- Attain the COC-specific GWPS as specified pursuant to Section 257.95(h);
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents 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 (applicable to material releases only); and
- Comply with standards for management of wastes as specified in Section 257.98(d).

Assessment of Corrective Measures Under the CCR Rule

**GREEN STATION CCR LANDFILL
GREEN STATION
WEBSTER COUNTY, KENTUCKY**

June 13, 2019

Prepared For:

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CONTENTS

Section	Page
ACRONYMS	iii
EXECUTIVE SUMMARY	1
1.0 INTRODUCTION.....	4
2.0 DESCRIPTION OF CURRENT CONDITIONS	5
2.1 Site Background.....	5
2.2 Site Investigation and Interim Measures.....	5
2.3 Conceptual Site Model (CSM)	6
2.3.1 Physical Setting.....	6
2.3.2 Geology.....	7
2.3.3 Hydrogeology.....	7
2.3.4 Constituents of Concern (COCs)	8
2.3.5 Impacted Media.....	8
2.3.6 COCs Distribution	8
2.3.7 Groundwater Quality	9
2.3.8 Potential Receptors / Pathways	9
3.0 CORRECTIVE ACTION OBJECTIVE (CAO).....	10
4.0 TECHNOLOGY IDENTIFICATION AND SCREENING	11
5.0 CORRECTIVE ACTION ALTERNATIVES ASSEMBLY	13
5.1 Assumptions for Corrective Measure Alternatives Development	13
5.2 Groundwater Corrective Measures Alternatives Overview	13
5.2.1 Alternative #1 – No Action and Groundwater Monitoring	13
5.2.2 Alternative #2a – CiP, ICs, and Groundwater Monitoring.....	14
5.2.3 Alternative #2b – CbR, ICs, and Groundwater Monitoring	14
5.2.4 Alternative #3 – CiP, Hydraulic Containment, Other Source Control, Ex-Situ Treatment, ICs, and Groundwater Monitoring	15
5.2.5 Alternative #4 – CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring	16
5.2.6 Alternative #5 – CiP, Other Source Control, ICs, and Groundwater Monitoring	16
6.0 ALTERNATIVE EVALUATION.....	17
6.1 Potential Data Gaps.....	17
7.0 REFERENCES.....	18

List of Tables

1. Green Station CCR Landfill Constituents of Concern
2. Green Station CCR Landfill Characterization Sample Results
3. Potential Corrective Measures Options Technology Description/Overview

List of Figures

1. Site Location Map
2. Well Location Map
3. Site Geologic Map
4. Cross-Section A-A'
5. Cross Section B-B'
6. Cross Section C-C'
7. Contaminants of Concern Distribution

List of Appendix

- A. Corrective Measures Technologies and Alternatives Evaluation Process

ACRONYMS

ACM	Assessment of Corrective Measures
AECOM	AECOM Technical Services, Inc.
BREC	Big Rivers Electric Corporation
°C	Degrees Celsius
CAO	Corrective Action Objectives
CbR	Closure by Removal
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
CiP	Closure in Place
cm/sec	Centimeters per second
COCs	Constituents of Concern
CSM	Conceptual Site Model
DO	Dissolved Oxygen
ft., amsl	Feet above mean sea level
ft., msl	Feet mean sea level
gpm	Gallons per minute
GWPS	Groundwater Protection Standards
ICs	Institutional Controls
KGS	Kentucky Geological Survey
Li	Lithium
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
mS/cm	milliSiemens per centimeter
mV	Millivolt
MW	Megawatts
NPDES	National Pollution Discharge Elimination System
NTU	Nephelometric Turbidity Unit
ORP	Oxidation Reduction Potential
RCRA	Resource Conservation and Recovery Act
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

AECOM Technical Services, Inc. (AECOM) was retained by Big Rivers Electric Corporation (BREC) to prepare an Assessment of Corrective Measures (ACM) to identify appropriate corrective measures for groundwater impacted by coal combustion residuals (CCR). The subject groundwater impacts are associated with the CCR that has been historically managed within the Green Station CCR Landfill (Green Landfill) at the Sebree Generating Station (Sebree Station), located near Sebree, Kentucky (Site). Groundwater monitoring was conducted for the CCR management unit in accordance with the United States Environmental Protection Agency's (USEPA) CCR rule (40 Code of Federal Regulations (CFR) Section 257.90 through Section 257.95). Detection and Assessment groundwater monitoring are complete at the Green Landfill, and one constituent of concern (COC), lithium (Li), has been identified based on exceedance of the applicable groundwater protection standard (GWPS) at a statistically significant level (SSL).

Section 257.96(c) requires this assessment to include an analysis of the effectiveness of potential corrective measures in meeting the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

- (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).

Several potential corrective measures technologies were evaluated to identify which ones could be carried forward as components of corrective measures alternatives. The results of the corrective measures technology evaluation are presented below:

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as standalone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established Corrective Action Objectives (CAOs).
Institutional Controls (ICs)	Retained as supplement to corrective measures alternatives	The use of ICs (i.e., Environmental Covenant, groundwater use restrictions, etc.) is retained as a useful technology. However, it is noted the ICs are not anticipated to be used as a stand-alone technology. Environmental Covenants, groundwater use restrictions, etc., are expected to be combined with other applicable technologies as part of corrective measures alternatives.
Groundwater Monitoring (Assessment and Detection mode)	Retained as supplement to corrective measures alternatives	The use of groundwater monitoring (Assessment and/or Detection modes as appropriate) when combined with other applicable technologies as part of any proposed corrective measures alternative is retained to address the CAO and to track the effectiveness of the overall remedy. However, it is not retained as a standalone technology.

Potentially Applicable Technology	Status	Description/Overview
Hydraulic Containment	Retained	The use of hydraulic containment is retained because it is an effective means of preventing offsite migration of soluble contaminants. Hydraulic containment requires management and potential ex-situ treatment of extracted groundwater, so it is not a stand-alone technology. The Conceptual Site Model (CSM) will guide the design of any groundwater extraction system to optimize the total discharge of groundwater needed to provide hydraulic containment.
Physical Containment	Retained	The use of physical containment is retained because it can be an effective means of managing groundwater flow. Physical containment often requires pairing with hydraulic containment and/or in-situ treatment (funnel and gate style) to manage the flux of groundwater flow into the system. The CSM will guide the design of any physical barrier system, but technology limitations increase implementation difficulty with scale.
Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment technologies are retained as a way of removing contaminants from extracted groundwater from a hydraulic containment system. Ex-situ treatment may be paired with wastewater treatment, non-groundwater release treatment systems, or with permitted discharge to manage groundwater contamination. The CSM and data gaps investigations will guide the design of any ex-situ treatment
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.
Other Source Control Technologies	Retained	Control of source area non-groundwater related releases. For the purposes of this groundwater ACM, management of non-groundwater releases are not included in the alternatives evaluation. Engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods are regarded as part of closure technologies selected by other means.

Note: Technologies that were retained may be used as components of a corrective action alternative, but when evaluated in conjunction with other available technologies any single technology may not be utilized.

Preliminary assembly of corrective measures alternatives was performed based on site-specific and regional geology and groundwater conditions. For the Green Landfill, six corrective measures alternatives were developed from this list of applicable corrective measures technologies:

- Alternative #1 – No Action and Groundwater Monitoring
- Alternative #2a – Closure in Place (CiP), Institutional Controls (ICs), and Groundwater Monitoring
- Alternative #2b – Closure by Removal (CbR), ICs, and Groundwater Monitoring
- Alternative #3 – CiP, Hydraulic Containment, Other Source Control (consisting of seepage collection and treatment), Ex-Situ Treatment, ICs, and Groundwater Monitoring

- Alternative #4 – CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring
- Alternative #5 – CiP, Other Source Control, ICs, and Groundwater Monitoring

The assembly of corrective measures alternatives is preliminary and could be revised at a later date following detailed analysis during the remedy selection process and/or following comment from the regulatory community and public. Specifically, a public meeting is required under Section 257.96(e) at least 30 days prior to the selection of remedy so that the owner or operator may discuss the results of the corrective measures assessment with interested and affected parties.

Following submittal of the ACM, the Site will begin the remedy selection process that is set forth in Section 257.97. The selected remedy must:

- Meet the requirements of Section 257.97(b) of the CCR Rule;
- Consider the standards in Section 257.97(c), and;
- Address the schedule and other factors specified in Section 257.97(d).

Upon remedy selection, a remedy selection report will be prepared that documents details of the selected remedy and how the selected remedy meets Section 257.97 requirements. As needed to accommodate further investigation(s) and/or evaluation, Section 257.97 requires the preparation of a semiannual report that documents progress toward remedy selection and design.

1.0 INTRODUCTION

The following report presents the Assessment of Corrective Measures (ACM) for groundwater impacts identified at the Green Station CCR Landfill (Green Landfill), which is a coal combustion residuals (CCR) management unit located at the Big Rivers Electric Corporation (BREC) Sebree Generating Station (Sebree Station), located near Sebree, Kentucky (Site).

Groundwater monitoring was conducted for the unit in accordance with the United States Environmental Protection Agency's (USEPA) CCR Rule (40 Code of Federal Regulations (CFR) Section 257.90 through Section 257.95). The results of Detection Monitoring (per Section 257.94) identified the presence of one or more indicator constituents (Appendix III to Section 257) with downgradient concentrations representing a statistically significant increase(s) (SSI) over background or upgradient conditions. The detection of one or more SSI required the implementation of Assessment Monitoring following the requirements of Section 257.95, which was initiated in June 2018. Assessment Monitoring results indicated the downgradient presence of one or more constituent of concern [COC] (Appendix IV to Section 257) at concentrations that represent a SSI over background concentration, and that represent a statistically significant level (SSL) over the groundwater protection standard(s) established in accordance with to Section 257.95(h).

For the Green Landfill, the following SSLs were identified:

- Lithium (Li) in MW-3A, MW-4, MW-5, and MW-6

The identification of these SSLs requires characterization of the nature and extent of impact (sufficient to support the ACM) in accordance with Section 257.95(g)(1) and the initiation of an ACM following the requirements of Section 257.96. Notice of ACM initiation dated January 14, 2019 was posted to BREC's publicly-accessible CCR reporting website.

Section 257.96(c) requires this ACM to include an analysis of the effectiveness of potential corrective measures in meeting the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

- (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).

This report presents the ACM evaluation in the following five sections, along with their associated appendices and attachments.

2.0 DESCRIPTION OF CURRENT CONDITIONS

This section provides information related to the current use of the Site, as well as the history of activities relevant to the ACM for the Green Landfill at the Sebree Station.

2.1 Site Background

BREC owns and operates Sebree Station, which is a coal-fired power generating facility located on the Green River northeast of Sebree, Kentucky. Sebree Station is composed of Green Station and Reid/HMP&L Station. The Sebree Station is bounded by Interstate-69 to the west and the Green River to the east (see **Figure 1**). Reid Unit 1 (66 Megawatts [MW]) began commercial operation in 1966 and it will be converted from coal to natural gas in the future. The Reid Combustion Turbine (72 MW) was commercialized in 1976. HMP&L Station 2, Units 1 (167 MW) and 2 (168 MW) began commercial operation in 1973 and 1974 respectively. Both HMP&L units were retired as of February 1, 2019. Green Station Units 1 (242 MW) and 2 (242 MW) began commercial operation in 1979 and 1981, respectively.

The location of the Green Landfill is illustrated on **Figure 2**. The Green Landfill is located directly south of Sebree Station, situated south of the Green Station CCR Surface Impoundment. The Green Landfill is a Kentucky permitted landfill (Permit No. SW11700007) that receives special wastes generated by burning coal (CCRs) from Green and Reid/HMP&L Stations. The landfill began receiving CCR wastes in 1980. The current Green Landfill footprint is approximately 170 acres.

As stated in the published CCR monitoring well network certification, available on the BREC website (<http://www.bigrivers.com/>), the original ground surface within the landfill footprint was irregular and the dominant features were small stream valleys draining towards the Green River, which is located just east of the landfill; and towards Groves Creek, which is located just south of the landfill. There was also historic oil and gas production at and in the immediate vicinity of the Green Landfill. A review of the records from the Kentucky Geological Survey (KGS) showed that at or immediately adjacent to the Site, there were a number of dry exploratory oil/gas exploration holes, oil production wells, one gas production well, and one secondary recovery injection well. There were also former brine ponds at the Site. Most of these wells were abandoned in accordance with applicable regulations by BREC in 1997 and 1998. The last existing well was decommissioned in 2019.

2.2 Site Investigation and Interim Measures

Monitoring wells were installed in the vicinity of the Green Landfill beginning in November 1996 prior to the implementation of the CCR Rule. However, the existing wells meet the requirements of Section 257.90 of the CCR Rule for installation of a groundwater monitoring system. These requirements are that wells must adequately represent the quality of background groundwater and groundwater representing the downgradient waste boundary. The existing wells are located along the perimeter of the footprint for the Green Landfill (**Figure 2**). One upgradient monitoring well (MW-1) and five downgradient monitoring wells (MW-2, MW-3A, MW-4, MW-5 and MW-6) were installed adjacent to the Green Landfill to determine the general direction of groundwater movement and to monitor groundwater at the Site. The monitoring wells were installed in the uppermost saturated portion of the sandstone bedrock aquifer.

Hydraulic testing (slug tests) was performed in April 2019, and nine rounds of Baseline groundwater sampling for Appendix III constituents were conducted between March 2016 and October 2017. Statistical evaluation for Detection monitoring indicated that SSIs over background had occurred, and therefore, Assessment monitoring was triggered. Detection monitoring activities and data are presented in the annual reports that have been prepared to date, (AECOM 2018 and 2019).

As part of Assessment monitoring, upgradient and downgradient wells for the Landfill were sampled for Appendix IV constituents in June, July, and September 2018. Groundwater Protection Standards (GWPS) were established for Assessment monitoring of the Appendix IV constituents, and statistical evaluation indicated exceedances of GWPSs at SSLs.

For the purposes of this ACM, the COC that exceeds GWPSs at SSLs is Li (see **Table 1**).

Table 1 Green Station CCR Landfill Constituents of Concern

Monitoring Well (Date)	Parameter Lithium Background UPL 0.008 GWPS 0.04 (mg/L)
MW-3A (Jun 2018)	0.699
MW-3A (Jul 2018)	0.790
MW-3A (Sep 2018)	0.766
MW-4 (Jun 2018)	1.81
MW-4 (Jul 2018)	1.91
MW-4 (Sep 2018)	1.81
MW-5 (Jun 2018)	0.459
MW-5 (Jul 2018)	0.481
MW-5 (Sep 2018)	0.425
MW-6 (Jun 2018)	0.0650
MW-6 (Jul 2018)	0.0590
MW-6 (Sep 2018)	0.0558

GWPSs are the greater of the site-specific background concentrations, the USEPA primary drinking water standard maximum contaminant limits (MCL), or GWPS provided in 40 CFR 257.95(3)(h)(2)
Bold red values exceed the GWPS by direct comparison; yellow shaded indicates an SSL above the GWPS (i.e., 95 LCL > GWPS) mg/L = milligrams per liter; UPL = Upper Prediction Limit.

No formal interim corrective measures have been performed at the Green Landfill but corrective measures for known non-groundwater releases are underway. The compatibility of those corrective measures with potential groundwater remedies is a consideration in this assessment.

2.3 Conceptual Site Model (CSM)

The main purpose of a CSM is to support the decision-making process for groundwater corrective action at the Green Landfill.

2.3.1 Physical Setting

The Site is mapped within the Interior Low Plateaus physiographic province (<https://www.nps.gov/subjects/geology/physiographic-provinces.htm>). The province is part of the Interior Plains division of the United States. Characteristic features of the province include unglaciated rolling limestone plains with alluvial valleys and entrenched rivers and streams. Several large rivers are in the region, including the Green, the Ohio, the Kentucky, the Tennessee, and the Cumberland Rivers. The

geology underlying the Site consists of unconsolidated materials, including loess and alluvial deposits, underlain by Upper to Middle Pennsylvanian-age clastics and carbonates consisting primarily of sandstone and shale. The unconsolidated material also include fill, silty and clayey residuum, and minor amounts of sandy, clayey channel fill alluvium.

The Green Landfill is located on an upland adjacent to the west bank of the Green River at an elevation of approximately 436 feet, above mean sea level [ft., amsl] (at the north end of the landfill) and 397 ft., amsl (at the south end of the landfill), with a maximum elevation of 608 ft., amsl at the landfill crest. Precipitation falling within the Green Landfill is directed to ponds in the north and south sides of the unit and then to the river under Kentucky Pollution Discharge and Elimination System (KPDES) permit. Underlying preconstruction soils consisted of Loring-Grenada, Loring-Zanesville-Wellston (Henderson County) and Loring-Wellston-Zanesville (Webster County) soil associations which are generally characterized as well drained to moderately well drained soils on nearly level to sloping uplands (Associated Engineers 2016, Hydrologic and Hydraulic Capacity Assessment and Initial Inflow Design Flood Control System Plan). The Green Landfill does not have an existing leachate collection and management system.

2.3.2 Geology

Figure 3 presents a geologic map of the site and vicinity. The Site lies in the Western Kentucky Coalfields section, characterized by rolling uplands underlain by coal-bearing bedrock of the Pennsylvanian Period. In the vicinity of the site, maximum topographic relief is on the order of 80 feet. The geologic quadrangle (Geologic map of the Robards quadrangle, Henderson and Webster Counties, Kentucky, 1973) for the Site vicinity published by the KGS shows the surficial material to be unconsolidated loess representing the Pleistocene and Holocene geologic epoch. The loess consists of sandy and clayey silt. The unconsolidated surficial materials, which include silty and sandy clay units, are up to approximately 25 feet in thickness.

The unconsolidated materials are shown to be underlain by bedrock of the Upper Pennsylvanian Shelburn Formation (formerly identified as the Lisman Formation (Fairer, 1973)) and the Middle Pennsylvanian Carbondale Formation. At the base of the Shelburn Formation is the Providence Limestone Member, consisting of limestone and interbedded shale, but this unit is absent in much of the area due to erosional channeling. Due to its discontinuous character and the presence of interbedded shale, hydrologically significant karst features are not present in the Providence Limestone Member. The underlying Carbondale Formation consists of cyclic sequences of sandstones, shales, siltstones and coals. The Carbondale sediments were deposited in a fluvial-deltaic system. As a result of this depositional environment, the lithologic units of the Carbondale tend to be lenticular bodies rather than continuous sheet-like strata. Gradational and abrupt horizontal changes in lithology are often encountered.

Cross-sections were prepared during development of this ACM, and cross-section locations are shown on **Figure 2**. The individual cross-sections are presented on **Figures 4, 5 and 6**. These sections illustrate the sequence of geologic materials present under the Green Landfill as evidenced by the currently available data.

2.3.3 Hydrogeology

For purposes of compliance with the CCR Rule groundwater monitoring requirements the interbedded sandstone and shale of the Carbondale Formation, is considered to be the uppermost aquifer underlying the Green Landfill. The uppermost aquifer is unconfined and first encountered at an elevation of approximately 401 ft., amsl at the northwest end of the landfill, and 367 ft., amsl at the southeast end of

the landfill (AECOM, 2019). Flow direction beneath the Site is typically southeast towards the Green River.

Slug tests were performed on April 25, 2019 at monitoring wells MW-3A, MW-4, MW-6, and MW-104 to assess the hydraulic characteristics of the uppermost aquifer. The estimated hydraulic conductivity of the monitoring wells tested ranged from 2×10^{-5} to 3×10^{-3} centimeters per second (cm/sec).

Although previous site-specific investigations have noted the presence of perched zones of saturation in the overlying unconsolidated materials, these discontinuous zones do not qualify as an uppermost aquifer under the CCR Rule because they do not produce usable quantities of groundwater.

2.3.4 Constituents of Concern (COCs)

As described in Section 2.2, a single Appendix IV constituent, Li, was detected at concentrations exceeding GWPS at multiple monitoring well locations. Li was detected at SSLs above the GWPS at the locations of monitoring wells MW-3A, MW-4, MW-5, and MW-6.

2.3.5 Impacted Media

Groundwater is the sole impacted media of concern addressed by this ACM. Non-groundwater releases will be covered under a separate ACM.

2.3.6 COCs Distribution

Groundwater analytical data from the Site investigations through 2018 indicate that COC concentrations above GWPSs are present in the vicinity of the Green Landfill along the south and east edges of the landfill, near the station's property boundary (**Figure 7**). COC concentrations at MW-1 and MW-2 were not above GWPSs at SSLs. Due to this, the area of projected corrective measures is confined to the area between and adjacent to MW-3A, MW-4, MW-5, and MW-6.

An additional characterization well, MW-104, was subsequently installed to estimate the downgradient extent of impacted groundwater. Sample collection for Appendix III and IV parameters took place in March and April 2019. The analytical results for Li were below the GWPS. The additional characterization data are summarized in **Table 2**.

Table 2 – Green Station CCR Landfill Characterization Sample Results

Monitoring Well (Date)	Parameter
	Lithium UPL 0.008 GWPS 0.04 (mg/L)
MW-104 (March 2019)	0.0281
MW-104 (April 2019)	0.0288

The two sampling event results from the characterization well help confirm the downgradient (southwestern) extent of COC impacts above the GWPS at the Green Landfill.

2.3.7 Groundwater Quality

In addition to the presence of COCs above GWPSs, other geochemical characteristics of the shallow aquifer zone consist of the following:

- The temperature of the samples taken at the downgradient wells during the September 2018 sampling event ranged from 16.92 degrees Celsius (°C) to 17.54 °C.
- Specific conductance ranged from 1.68 to 8.00 milliSiemens per centimeter (mS/cm).
- Dissolved Oxygen (DO) concentration ranged from 0.42 to 6.36 mg/L.
- Oxidation Reduction Potential (ORP) ranged from -83 to 447 milliVolts (mV). The only monitoring well sample with a negative ORP was collected from monitoring well MW-2.
- Turbidity of the samples ranged from 0.14 to 25.6 Nephelometric Turbidity Units (NTU).
- The pH of the samples ranged from 6.50 to 6.72.
- Total Dissolved Solids (TDS) concentration of the samples ranged from 937 to 5,170 mg/L.

2.3.8 Potential Receptors / Pathways

Contact with water (e.g., shallow groundwater or surface water) impacted by COCs at levels above GWPS is regarded as the potential pathway for exposure of potential receptors. Based on data published by KGS, there are no known groundwater wells used for drinking water within a 1-mile radius of the Green Landfill, thus limiting the potential receptors to the surface water, i.e., the Green River and its tributary, Groves Creek. The pathways to these receptors include seepage of water from the Green Landfill through manmade and natural hydraulic barriers.

Other potential exposure pathways (e.g., soil or vapor) are not considered complete as the CCR material is isolated in the unit. This isolation prevents direct access by individuals that might result in direct contact or ingestion. In addition, the inherent non-volatile nature of the unit-specific COCs eliminates the potential for a complete vapor pathway (i.e., vapor intrusion to indoor air). Therefore, soil and vapor pathways will not be considered within the context of this ACM.

3.0 CORRECTIVE ACTION OBJECTIVE (CAO)

For CCR units, 40 CFR Parts 257.90 through 257.98 outlines the groundwater monitoring programs (Detection and Assessment) and the corrective action evaluation process, which provide the basis for the development of the site-specific CAO. Detection and Assessment groundwater monitoring are complete at the Landfill, and the COC Li has been identified based on exceedance of the GWPS.

Section 257.96(c) requires this assessment to include an analysis of the effectiveness of potential corrective measures to meet the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

- (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 subsequent remedy selection process will evaluate the following objectives for remedies, as required under Section 257.97(b):

- Protect human health and the environment;
- Attain the COC-specific GWPSs as specified pursuant to Section 257.95(h);
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents 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 (applicable to material releases only); and
- Comply with standards for management of wastes as specified in Section 257.98(d).

Together, these requirements comprise the site-specific CAO that will be used during the remedy selection process.

4.0 TECHNOLOGY IDENTIFICATION AND SCREENING

As required under Section 257.97(b), source control is one element of the CAO that is intended to prevent further releases from the source, i.e., the Green Landfill. In adherence with the BREC’s permit conditions, the Site will continue to operate as a solid waste disposal facility through its life cycle and will be closed in accordance with the requirements of the permit. Source control through landfill closure will include installation of final cover that will prevent infiltration and contribute to groundwater quality restoration. Control of non-groundwater sources associated with the Green Landfill are also planned and are described separately.

The identification and screening of potentially applicable corrective measures technologies for groundwater downgradient of the Green Landfill is presented in **Appendix A** to this report. The findings of that screening are summarized in the table below.

Table 3 – Potential Corrective Measures Options Technology Description/Overview

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as standalone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established CAOs.
Institutional Controls (ICs)	Retained as supplement to corrective measures alternatives	The use of ICs (i.e., Environmental Covenant, groundwater use restrictions, etc.) is retained as a useful technology. However, it is noted the ICs are not anticipated to be used as a stand-alone technology. Environmental Covenants, groundwater use restrictions, etc., are expected to be combined with other applicable technologies as part of corrective measures alternatives.
Groundwater Monitoring (Assessment and Detection mode)	Retained as supplement to corrective measures alternatives	The use of groundwater monitoring (Assessment and/or Detection modes as appropriate) when combined with other applicable technologies as part of any proposed corrective measures alternative is retained to address the CAO and to track the effectiveness of the overall remedy. However, it is not retained as a standalone technology.
Hydraulic Containment	Retained	The use of hydraulic containment is retained because it is an effective means of preventing offsite migration of soluble contaminants. Hydraulic containment requires management and potential ex-situ treatment of extracted groundwater, so it is not a stand-alone technology. The CSM will guide the design of any groundwater extraction system to optimize the total discharge of groundwater needed to provide hydraulic containment.
Physical Containment	Retained	The use of physical containment is retained because it can be an effective means of managing groundwater flow. Physical containment often requires pairing with hydraulic containment and/or in-situ treatment (funnel and gate style) to manage the flux of groundwater flow into the system. The CSM will guide the design of any physical barrier system, but technology limitations increase implementation difficulty with scale.

Green Station CCR Landfill
 Assessment of Corrective Measures

Potentially Applicable Technology	Status	Description/Overview
Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment technologies are retained as a way of removing contaminants from extracted groundwater from a hydraulic containment system. Ex-situ treatment may be paired with wastewater treatment, non-groundwater release treatment systems, or with permitted discharge to manage groundwater contamination. The CSM and data gaps investigations will guide the design of any ex-situ treatment
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.
Other Source Control Technologies	Retained	Control of source area non-groundwater related releases. For the purposes of this groundwater ACM, management of non-groundwater releases are not included in the alternatives evaluation. Engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods are regarded as part of closure technologies selected by other means.

References: Technology descriptions referenced from 1) FRTR: Federal Remediation Technologies Roundtable, CLU-IN, and/or AECOM reference materials.

5.0 CORRECTIVE ACTION ALTERNATIVES ASSEMBLY

Applicable corrective measures technologies identified in Section 4.0 above were assembled into corrective measures alternatives for evaluation (see **Appendix A** and Section 6.0). Each corrective measures alternative consists of one or more corrective measures technologies assembled into a strategy for the groundwater remedy. Six corrective measures alternatives for the Green Landfill were assembled and are described below.

- **Alternative #1** – No Action and Groundwater Monitoring
- **Alternative #2a** – Closure in Place (CiP), Institutional Controls (ICs), and Groundwater Monitoring
- **Alternative #2b** – Closure by Removal (CbR), ICs, and Groundwater Monitoring
- **Alternative #3** – CiP, Hydraulic Containment, Other Source Control, Ex-Situ Treatment, ICs, and Groundwater Monitoring
- **Alternative #4** – CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring
- **Alternative #5** – CiP, Other Source Control, ICs, and Groundwater Monitoring

5.1 Assumptions for Corrective Measure Alternatives Development

In developing the corrective measures alternatives, a number of assumptions have been made based on the data available to AECOM at the time of this report and operational plans as reported by the owner/operator. The specific assumptions include:

- The currently observed dissolved phase groundwater impacts are limited to the area between and adjacent to monitoring well locations MW-3A, MW-4, MW-5, and MW-6 along the south and east edges of the landfill.
- Groundwater impacts are limited to the saturated zone between the observed water table at approximate elevation 370 feet mean sea level (ft., msl) and the base of the aquifer at approximately 320 ft-msl.
- Ex-situ treatment of groundwater may involve physical/chemical methods and/or discharge to a permitted National Pollution Discharge and Elimination System (NPDES) outfall.
- Groundwater corrective measures will be conducted until the CAOs are met. The objectives may be met at an earlier date, but the alternatives analysis is based on the conservative assumption that corrective measures and the associated monitoring of groundwater conditions will be required for up to 30 years following the initiation of the corrective measures.
- CiP and Other Source Control are part of planned plant operations.

5.2 Groundwater Corrective Measures Alternatives Overview

The developed groundwater corrective measures alternatives, outlined above, are detailed in the following sections.

5.2.1 Alternative #1 – No Action and Groundwater Monitoring

Alternative #1 consists of taking no action to remedy the CCR impact observed in the Green Landfill groundwater monitoring system. Under the No Action alternative, no corrective measures would be

implemented to remove, control, mitigate, or minimize exposure to impacted groundwater. Groundwater monitoring (Assessment) is required by the CCR rule during the nominal performance period of 30 years to track the effectiveness of the alternative and to identify conditions that allow the return to Detection monitoring. The No Action alternative establishes a baseline, or reference point against which each of the developed corrective measures alternatives may be compared.

5.2.2 Alternative #2a – CiP, ICs, and Groundwater Monitoring

Alternative #2a employs a combination of three of the retained corrective measures technologies:

- CiP source control, which consists of two elements: routine cover management during landfill operation, and planned closure activities to be conducted at the end of the landfill's operational life cycle;
- Implementation of ICs designed to restrict the property to industrial use and to prohibit groundwater use for potable purposes; and
- Groundwater Monitoring (Assessment) to track the effectiveness of the corrective measures and to identify conditions that allow the return to Detection monitoring and ultimately to cessation of corrective measures.

CiP was selected as the source control technology because the unit is a state-permitted solid waste facility subject to operational and closure controls designed to limit the potential for impact to human health and the environment.

Implementation of ICs is employed to help maintain the CiP and associated corrective measures by limiting the accessibility of the unit to unauthorized users and restricting future use of the property to those activities that may result in exposure potentials. ICs for the landfill are specifically addressed by the facility's solid waste permit, which restricts the use of the property and associated resources (groundwater).

Groundwater monitoring of the unit is required by 40 CFR 257.90 through .98. The unit triggered Assessment mode monitoring by the detection of indicator parameters (Appendix III of 40 CFR 257) in downgradient monitoring wells at concentrations representing a SSI over background. Continued groundwater monitoring is required under 40 CFR 257.95 until the CAOs are met. The CAOs are anticipated to be met as the effect of source control technologies are realized and as natural attenuation mechanisms (advection, dilution and dispersion) take effect.

5.2.3 Alternative #2b – CbR, ICs, and Groundwater Monitoring

Alternative #2b is similar to Alternative #2a except that CiP is replaced by CbR, which consists of excavation and removal of the Green Landfill, implementation of ICs and an Environmental Covenant intended to restrict the unit to industrial use and prohibit groundwater use for potable purposes. The excavation of impacted CCR material would typically be completed using standard construction equipment (e.g., backhoe, excavator, wheel loader, dump trucks). The excavated materials are then placed directly into dump trucks for transport/disposal or beneficial use. Excavation limits would typically be verified with confirmation sampling to demonstrate that the underlying soil is not impacted above applicable standards.

Groundwater monitoring of the unit is required by 40 CFR 257.90 through .98. The unit triggered Assessment mode monitoring by the detection of indicator parameters (Appendix III of 40 CFR 257) in downgradient monitoring wells at concentrations representing a SSI over background. Continued groundwater monitoring is required under 40 CFR 257.95 until the CAOs are met. The CAOs are

anticipated to be met as the effect of source control technologies are realized and as natural attenuation mechanisms (advection, dilution and dispersion) take effect.

5.2.4 Alternative #3 – CiP, Hydraulic Containment, Other Source Control, Ex-Situ Treatment, ICs, and Groundwater Monitoring

Alternative #3 builds on Alternative #2a to also include the addition of Hydraulic Containment, Other Source Control, and Ex-Situ Treatment of groundwater:

- CiP source control, which consists of two elements: routine cover management during landfill operation, and planned closure activities to be conducted at the end of the landfill's operational life cycle;
- Hydraulic Containment using one or more vertical wells designed to prevent the movement of impacted groundwater past the limits of the unit to the downgradient groundwater environment and potential points of exposure;
- Other Source Control in the form of draining and lining the south Leachate Pond, which helps eliminate the potential for additional contaminant migration from the landfill, and managing existing non-groundwater seepages;
- Ex-Situ Treatment of groundwater extracted for hydraulic containment, which involves above-ground physical/chemical treatment methods and/or permitted discharge for until the CAOs are achieved;
- Implementation of ICs designed to restrict the property to industrial use and to prohibit groundwater use for potable purposes; and
- Groundwater Monitoring (Assessment mode) to track the effectiveness of the corrective measures and to identify conditions that allow the return to Detection mode monitoring and ultimately to cessation of corrective measures.

Vertical groundwater recovery wells for Hydraulic Containment would be installed near the downgradient limit of the unit. It is noted that Pre-Design Studies will be needed to identify the appropriate number, design, and spacing of the extraction well system, but for the purposes of this ACM, preliminary specifications are as follows:

- Five vertical groundwater extraction wells;
- The extraction wells would be installed along the south side and the southeast corner of the landfill, equally spaced between MW-6 and MW-3A;
- Well installed to a depth of approximately 50-75 ft-bgs;
- Estimated total groundwater extraction rate of 200 gallons per minute (gpm).

Alternative #3 incorporates treatment of extracted groundwater before it can be discharged to an outfall. Treatment will consist of piping the extracted groundwater to an existing surface water impoundment at the Sebree Station, which will allow for compliance with discharge permits through an established NPDES outfall.

Other Source Control would consist of re-design of the pond located south of Green Landfill by dividing the pond into thirds. The east and west sections of the pond will be designed to collect non-groundwater seepage from around the toe of the unit so that it can be isolated and pumped to a central location for treatment. The middle section of the pond will continue to be used for stormwater collection.

The COC concentrations downgradient of the hydraulic containment would also be expected to decrease over time through natural attenuation mechanisms including advection, dilution, and dispersion. As such, groundwater monitoring would be modified to include system performance monitoring, which may require installation of wells at new locations to evaluate the efficacy of hydraulic containment and to identify when CAOs have been achieved.

5.2.5 Alternative #4 – CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring

Alternative #4 is similar to Alternative #2a except for the addition of a Physical Containment barrier such as a slurry wall or grout curtain along the affected downgradient boundary of the unit to contain groundwater flow. Impacted groundwater would be contained by grout curtain constructed in a funnel-and-gate arrangement that directs the flow of groundwater to an extraction point at the gate, from which groundwater is pumped and conveyed to ex-situ treatment. Design of a Physical Containment system is largely driven by the depth and character of the groundwater bearing zone, and the length barrier needed to effect containment. In this case, the aquifer ranges to depths on the order of 75 feet below ground surface near the downgradient limit of the unit. The projected length of a physical barrier is 4,000 feet. Similar to Alternative #3, Treatment will consist of piping the extracted groundwater to an existing surface water impoundment at the Sebree Station, which will allow for compliance with discharge permits through an established NPDES outfall.

5.2.6 Alternative #5 – CiP, Other Source Control, ICs, and Groundwater Monitoring

Alternative #5 builds on Alternative #2a to also include the addition of Other Source Control for non-groundwater releases. Other Source Control would consist of draining and lining the pond located south of Green Landfill with geomembrane, and dividing the pond into sections. The east and west sections of the pond will collect the seepage, where it will be pumped to a central location for treatment. The middle section of the pond will continue to be used for stormwater collection.

6.0 ALTERNATIVE EVALUATION

The formal remedy selection process, in accordance with the CCR Rule 40 CFR Section 257.97, will begin following submission of the ACM Report. The subsequent remedy selection process will evaluate the following objectives for remedies, as required under Section 257.97(b):

- Protect human health and the environment;
- Attain the COC-specific GWPSs as specified pursuant to Section 257.95(h);
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents 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 (applicable to material releases only); and
- Comply with standards for management of wastes as specified in Section 257.98(d).

6.1 Potential Data Gaps

No data gaps investigation is projected at this time.

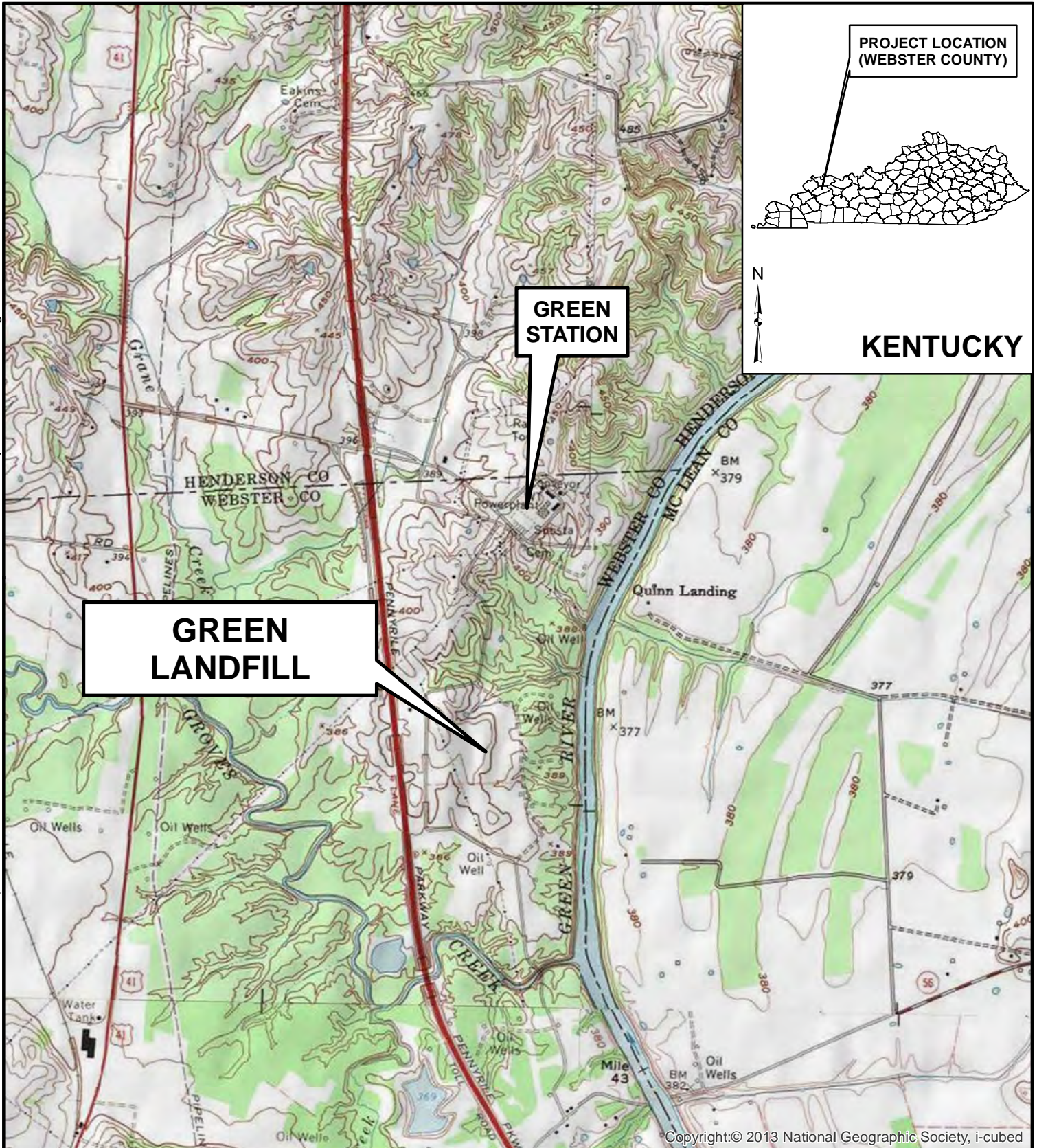
Depending on which alternative is selected, a data gap investigation may be needed to further refine the targeted areas for corrective measures. Potential data gaps may include the following:

- 1) Supplemental Groundwater Investigation – This investigation may consist of additional monitoring well installation and sampling to refine the existing CSM as well as to provide data related to the hydraulic characteristics of the subsurface.
- 2) Physical Containment Profile – Prior to committing to a physical barrier design, it may be necessary to probe the subsurface along the proposed alignment to:
 - Establish the character of the materials through which the barrier would be installed,
 - The depth to confinement where the barrier would terminate.

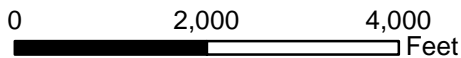
7.0 REFERENCES

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Figures



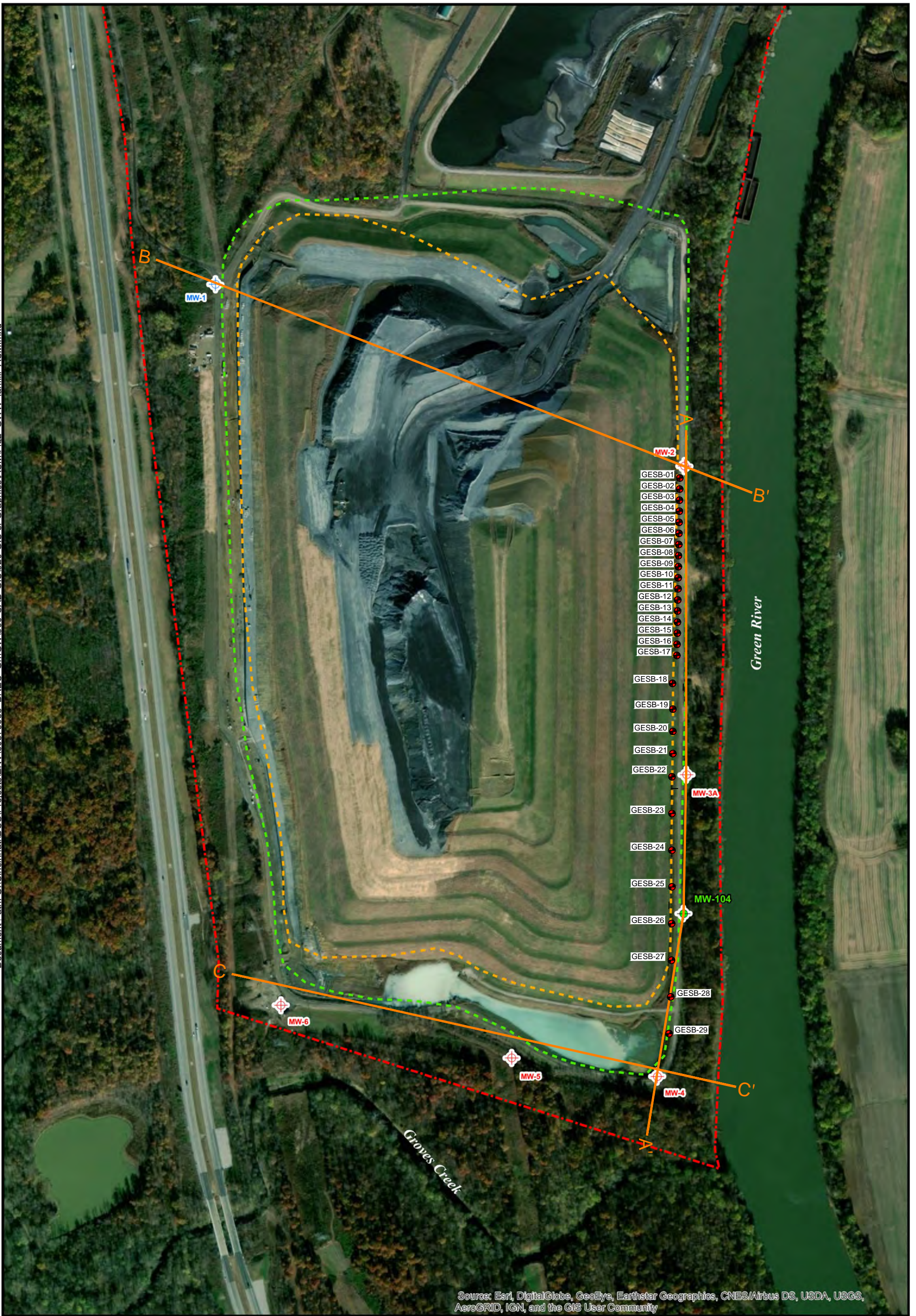
UNITED STATES
 DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY
 ROBARDS QUADRANGLE
 DELAWARE QUADRANGLE
 (FROM ARCGIS ONLINE Copyright:© 2011 National Geographic Society, i-cubed)



Big Rivers *Green Station*
 ELECTRIC CORPORATION *Webster County, Kentucky*

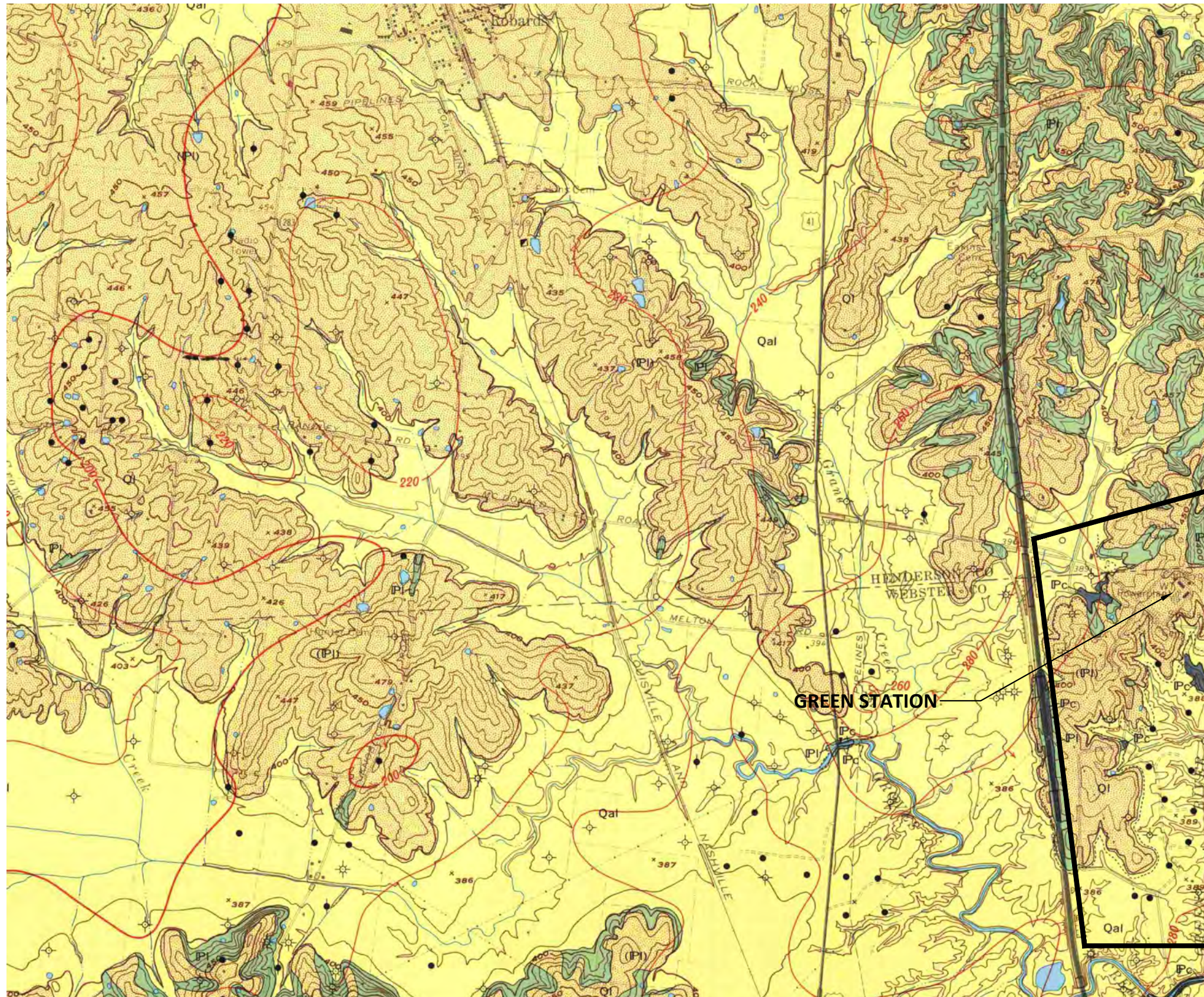
FIGURE 1
SITE LOCATION MAP

DATE: 4/30/2019	SCALE: 1IN = 2,000 FEET
CREATED BY: ALW	
JOB NO. 60602364	



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend Property Line KAR Permit Area CCR Fill Area Downgradient CCR Monitoring Well Upgradient CCR Monitoring Well Characterization Well		A — A' Transect Line Seeps Investigation Borings		0 400 800 Feet		N 	 Green Station Webster County, Kentucky	
FIGURE 2 WELL LOCATION MAP								
DATE: 5/17/2019		SCALE: 1IN = 300 FEET		CREATED BY: ALW			JOB NO. 60602364	



EXPLANATION

Pleistocene and Holocene	Qal	QUATERNARY
	Alluvium	
Pleistocene	Ql	QUATERNARY
	Loess	
Upper Pennsylvanian	Pl m	PENNSYLVANIAN
	Lisman Formation m, base of Madisonville Limestone Member	
Middle Pennsylvanian	Pc	PENNSYLVANIAN
Carbondale Formation		

Formation symbols enclosed in parentheses where units concealed by mapped surficial deposits

Contact or key bed
Dashed where inferred; dotted where concealed. Triangles indicate selected localities where contacts were well exposed at time of mapping

Strike and dip of beds

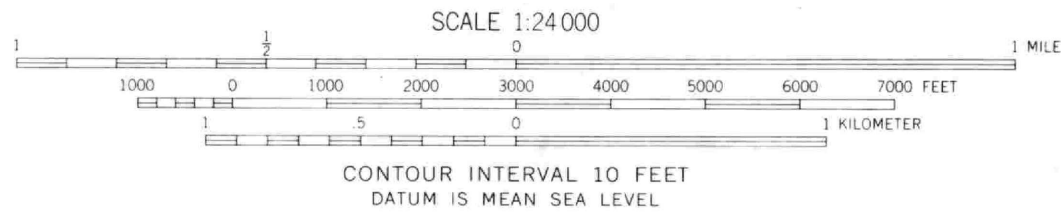



Structure contours
Drawn on base of No. 9 coal bed; projected where contoured horizon is missing. Arrows indicate direction of dip. Contour interval 20 feet

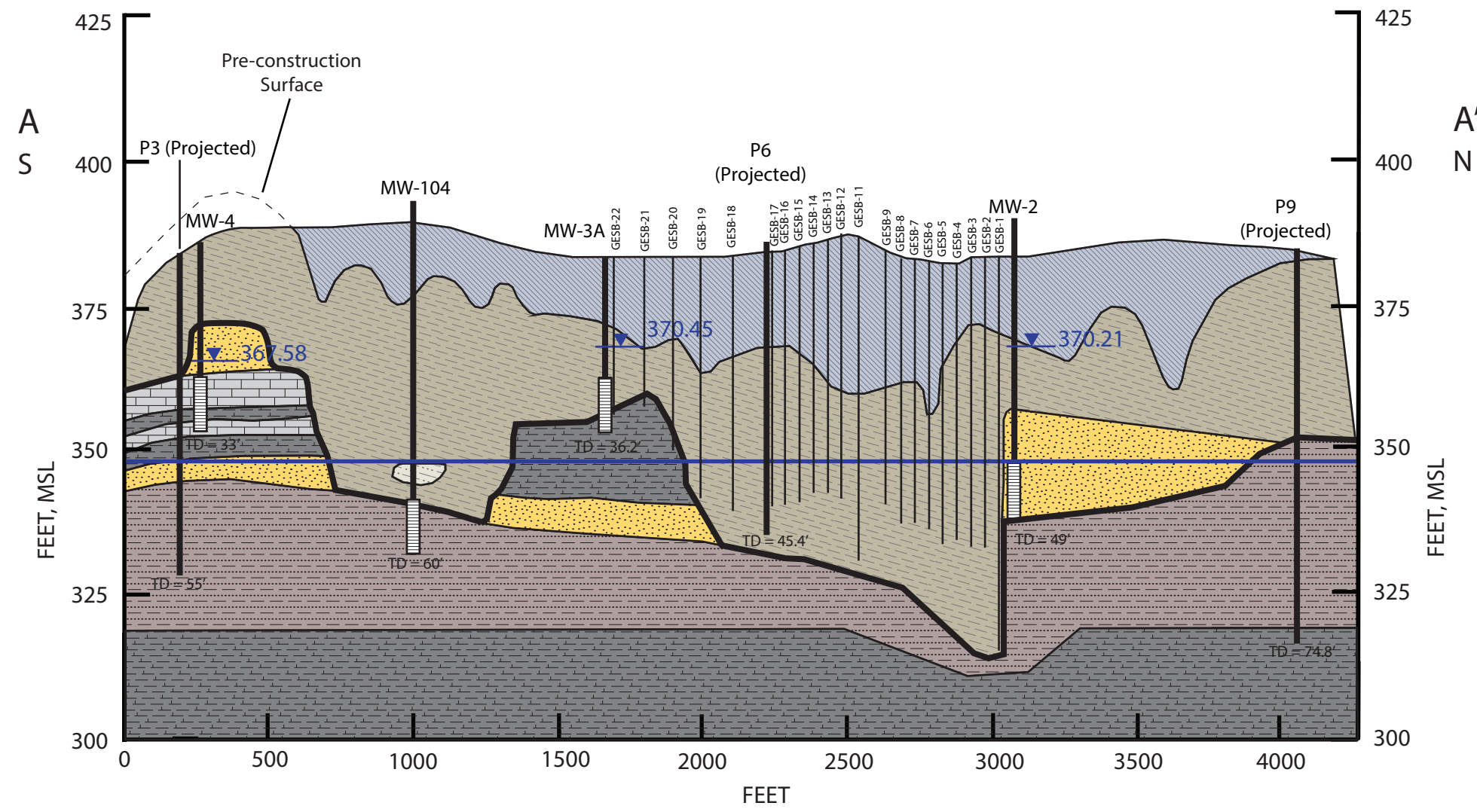
Outline of area where No. 9 coal bed is missing

DRILL HOLES FROM WHICH SUBSURFACE STRUCTURAL DATA WERE OBTAINED, AS OF JANUARY 1, 1971

- Dry hole
- Oil well



 Green Station Webster County, Kentucky	
FIGURE 3 SITE GEOLOGIC MAP (KENTUCKY GEOLOGICAL SURVEY)	
DATE: 05/21/2019	SCALE: AS SHOWN
CREATED BY: DAS	
JOB NO. 60602364	



LEGEND

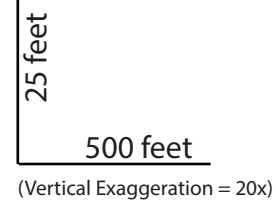
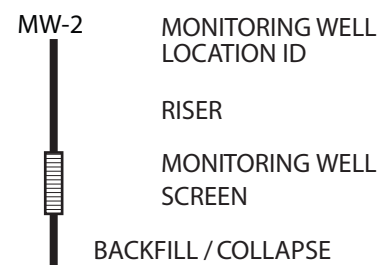
UNCONSOLIDATED MATERIALS:

- Fill
- Silt
- Silty Clay
- Clayey Silt

BEDROCK LITHOLOGIES:

- Sandstone
- Shale
- Limestone
- Interbedded Sandstone and Shale

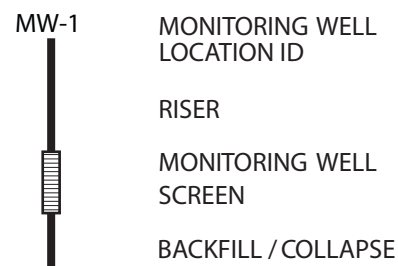
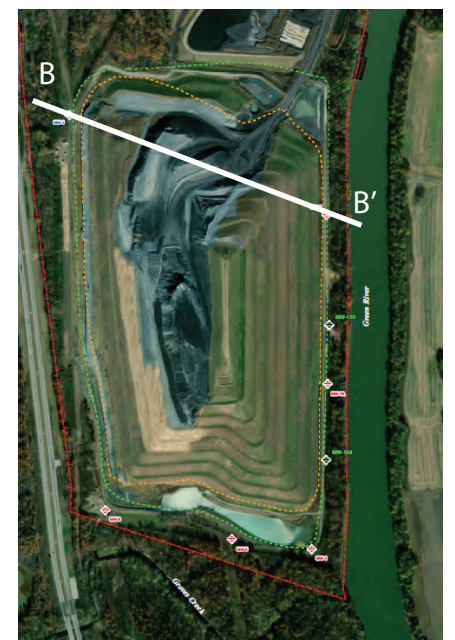
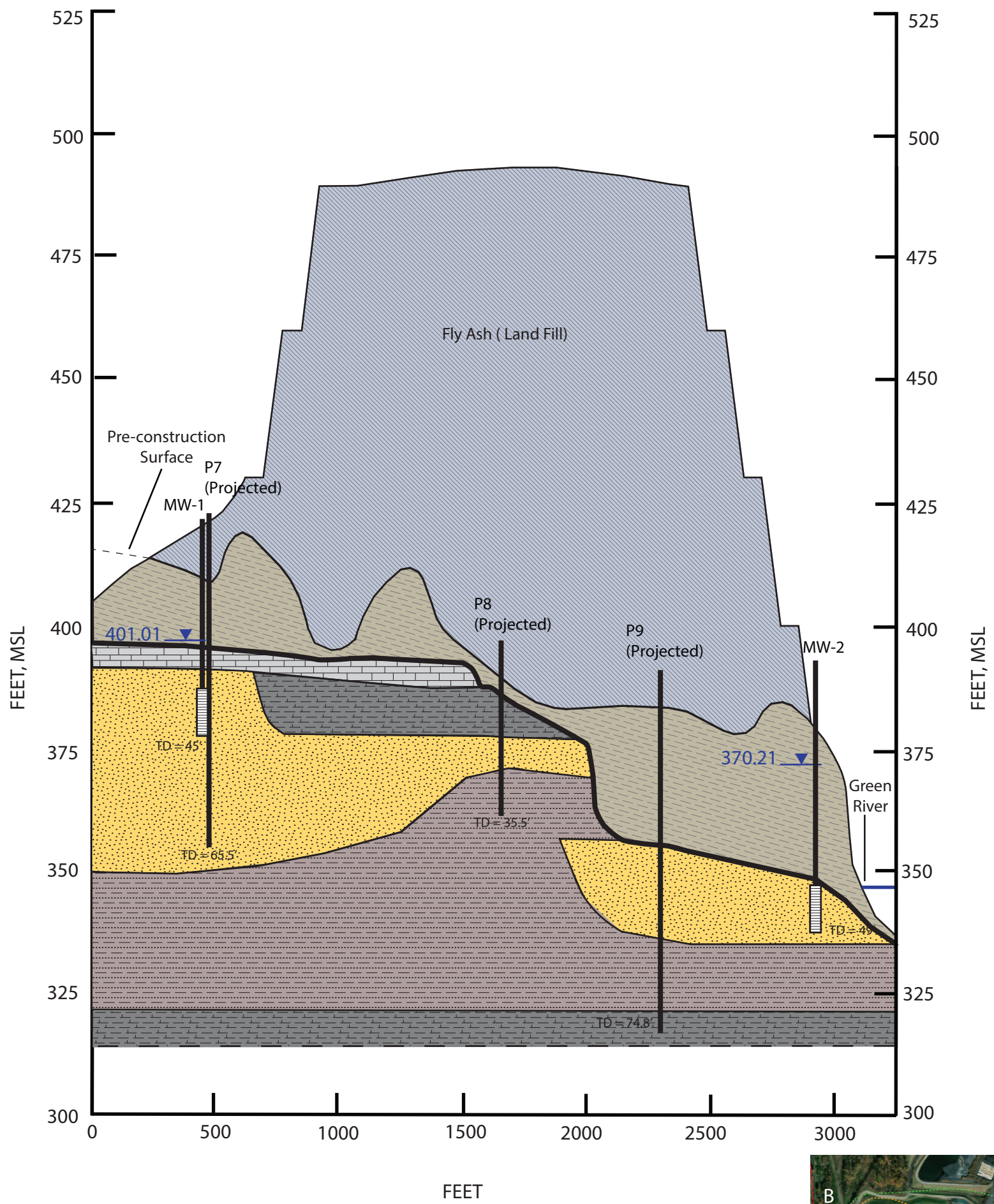
- Potentiometric Surface September 28, 2018
- Green River Elevation (348 ft)



Green Station Webster County, Kentucky	
FIGURE 4 CROSS SECTION A - A'	
DATE: 05/21/2019	SCALE: AS SHOWN
CREATED BY: MRH	
JOB NO. 60602365	

B
W

B'
E



▼ Potentiometric Surface September 28, 2018
 — Green River Elevation (348 ft)

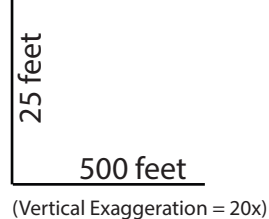
LEGEND

UNCONSOLIDATED MATERIALS:

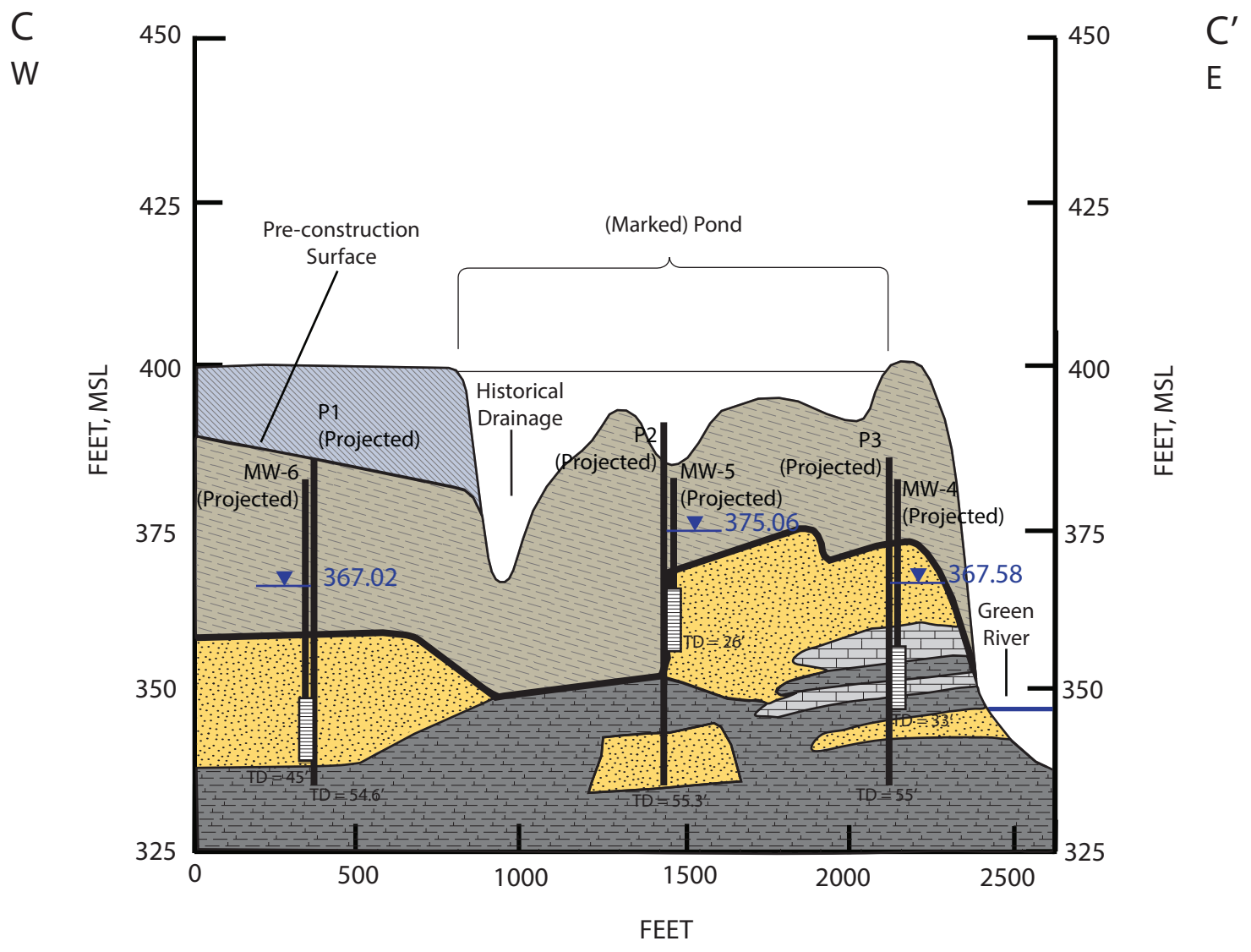
- Fill
- Silty Clay

BEDROCK LITHOLOGIES:

- Sandstone
- Shale
- Limestone
- Interbedded Sandstone and Shale



Green Station Webster County, Kentucky	
FIGURE 5 CROSS SECTION B - B'	
DATE: 05/21/2019	SCALE: AS SHOWN
CREATED BY: MRH	
JOB NO. 60602365	






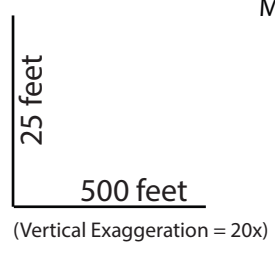
LEGEND

UNCONSOLIDATED MATERIALS:


-  Fill
-  Silty Clay

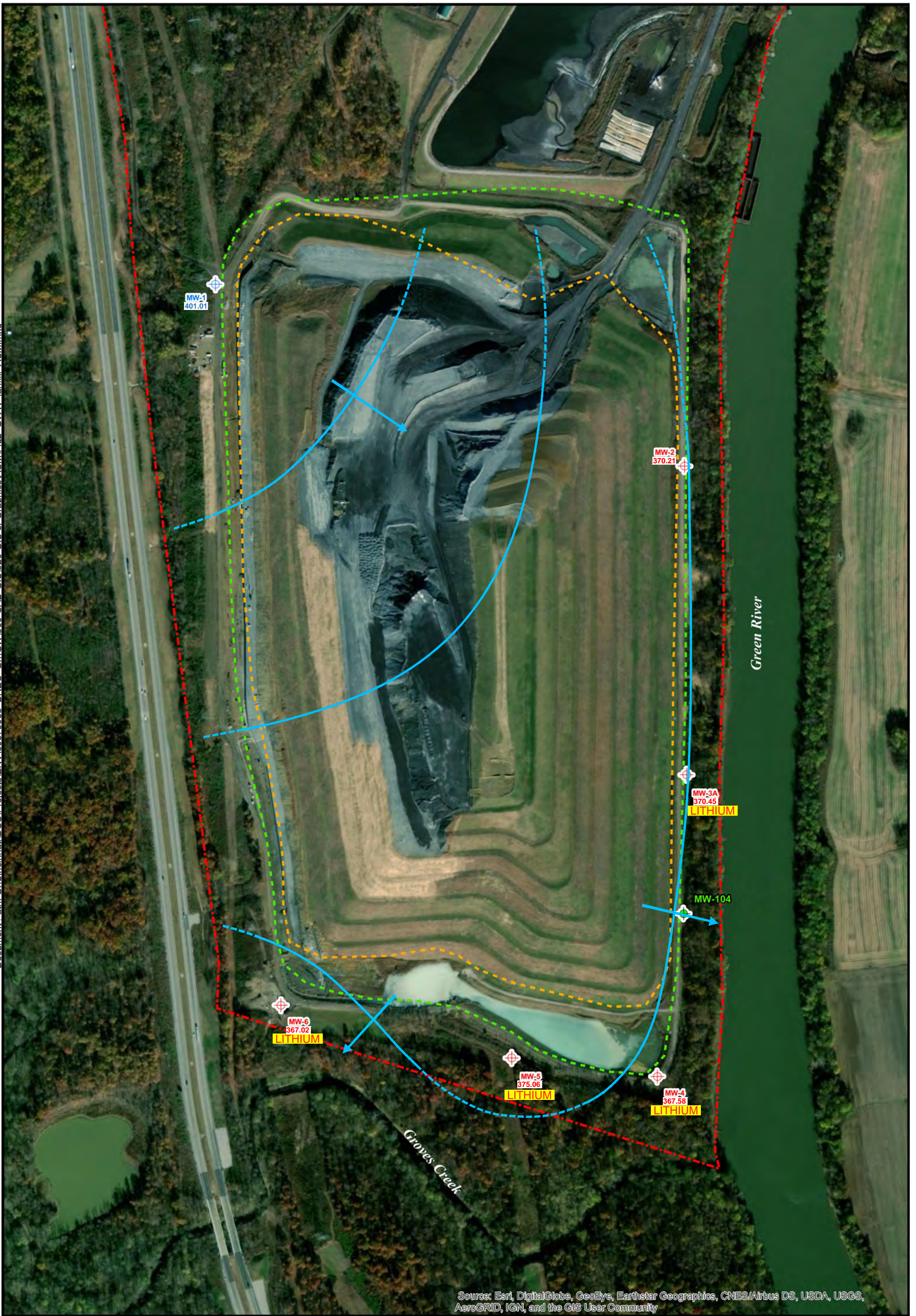
BEDROCK LITHOLOGIES:

-  Sandstone
-  Shale
-  Limestone



- MONITORING WELL LOCATION ID
- RISER
- MONITORING WELL SCREEN
- BACKFILL / COLLAPSE

		Green Station Webster County, Kentucky
FIGURE 6 CROSS SECTION C - C'		
DATE: 05/21/2019	SCALE: AS SHOWN	
CREATED BY: MRH		
JOB NO. 60602365		



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend Property Line KAR Permit Area CCR Fill Area Downgradient CCR Monitoring Well Upgradient CCR Monitoring Well Characterization Well	Water Table Contour (Inferred from Available Monitoring Data) Groundwater Flow Direction Groundwater Elevation (Feet, MSL) Measured September 28, 2018	 N	Big Rivers ELECTRIC CORPORATION Green Station Webster County, Kentucky
	0 400 800 Feet		
		DATE: 5/17/2019	SCALE: 1IN = 300 FEET
		CREATED BY: ALW	
		JOB NO. 60602364	

Appendix A

Corrective Measures Technologies and Alternatives Evaluation Process

Appendix A
Corrective Measures Technologies and
Alternatives Screening Process

CONTENTS

Section	Page
A1.0 CORRECTIVE MEASURES EVALUATION PROCESS.....	1
A1.1 Potential Remedial Technologies	1
A1.2 Other Source Control Technologies.....	3
A1.3 No Action.....	3
A1.4 Institutional Controls (ICs).....	4
A1.5 Groundwater Monitoring	4
A1.6 Hydraulic Containment.....	4
A1.7 Physical Containment	5
A1.8 Ex-Situ Physical/Chemical/Biological Treatment	6
A1.9 In-Situ Physical/Chemical/Biological Treatment	6
A1.10 Permeable Reactive Barriers (PRB)	6
A1.11 Closure-in-Place (CiP) [of the regulated unit]	7
A1.12 Closure by Removal (CbR) [of the regulated unit]	7
A1.13 Screened Corrective Measures Technologies Summary	7
A2.0 CORRECTIVE MEASURES ALTERNATIVES	9

Tables

Table A1	Potential Remedial Technologies
Table A2	Screened Corrective Measures Technologies

A1.0 CORRECTIVE MEASURES EVALUATION PROCESS

This appendix describes the overall process used in the selection and screening of corrective measures technologies that are considered potentially applicable to Coal Combustion Residuals (CCR) groundwater impacts at the subject Site. This appendix also describes the process for assembling preliminary corrective measures alternatives from one or more applicable technologies and evaluating these alternatives.

A1.1 Potential Remedial Technologies

Section 257.96(c) requires this assessment to include an analysis of the effectiveness of potential corrective measures to meet the objectives for remedies under Section 257.97(b), addressing at least the following:

- (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 following corrective measures technologies are regarded as potentially applicable to corrective measures for CCR groundwater impact:

- No Action (Included as a baseline case)
- Institutional Controls (ICs)
- Groundwater Monitoring
- Hydraulic Containment
- Physical Containment
- Ex-situ Physical/Chemical/Biological Treatment
- In-situ Physical/Chemical/Biological Treatment
- Permeable Reactive Barrier (PRB)
- Closure in Place (CiP) (of the regulated unit)
- Closure by Removal (CbR) (of the regulated unit)

A brief overview of these technologies is provided below in **Table A1**.

Table A1 – Potential Remedial Technologies

Potential Technology	Description/Overview
No Action	Default baseline approach against which other options are evaluated. No corrective action would be taken to remove, control, mitigate or minimize exposure to impacted media.
Institutional Controls (ICs)	Non-engineering measures, such as administrative and/or legal controls that help to minimize the potential for human exposure to contamination, and/or to protect the integrity of a remedy by limiting land or resource use (United States Environmental Protection Agency [USEPA), <i>Institutional Control Data Standard</i> EX000015.1, January 6, 2006).
Groundwater Monitoring	Groundwater monitoring (Assessment and/or Detection modes) to assess effectiveness of corrective measures performance, as well as natural subsurface processes such as dilution, adsorption, and chemical reactions that together serve to reduce inorganic constituents of concern (COC) concentrations to acceptable levels.
Hydraulic Containment	Hydraulic containment is a common method for remediating groundwater impacted with metals and other inorganics. Groundwater is pumped from wells or collection trenches to aboveground discharge point or to a treatment system that removes the contaminants. The extraction network would be designed to provide hydraulic containment of the impacted groundwater, preventing it from flowing downgradient towards surface water or other receptors.
Physical Containment	Physical barriers are walls constructed below the ground surface to control or restrict the flow of groundwater. They are constructed by injection grouting or by the use of excavator or deep trenching equipment to insert and thoroughly mix a selected amendment to create a homogenized impermeable wall that prevents impacted groundwater from flowing downgradient. The bottom of the physical containment structure is typically keyed into a low-permeability soil or bedrock (confining layer) to keep groundwater from seeping beneath the wall. To provide hydraulic control of the impacted groundwater behind (upgradient of) the physical barrier and to prevent impacted water from flowing around the edges of the wall, extraction wells would be installed behind the vertical barrier (VB) and the extracted groundwater processed through a treatment system.
Ex-situ Physical/Chemical/Biological Treatment	Ex-situ treatment requires pumping of groundwater and engineering for equipment, possible permitting, and material handling. Physical/chemical treatment uses the physical properties of the contaminants or the contaminated medium to destroy (i.e., chemically convert), separate, or contain the contamination. Physical/chemical treatment can be completed in short time periods (in comparison with biological treatment). Equipment is readily available. Treatment residuals from separation techniques will require treatment or disposal.

Potential Technology	Description/Overview
In-situ Physical/Chemical Treatment	With in-situ treatment, groundwater is treated without being brought to the surface. In-situ processes, however, generally require longer time periods. Physical/chemical treatment uses the physical properties of the contaminants or the contaminated medium to destroy (i.e., chemically convert), or separate the contamination.
Permeable Reactive Barriers (PRB)	A PRB is a constructed subsurface barrier designed to intercept groundwater flow and react with the entrained COCs. PRBs can be established through trench injection or direct-push injection (on closely spaced grids) of reactive material. PRBs are typically installed to the depth of impacted groundwater (often the bottom of the shallow aquifer) and along the length of the impacted zone. The amendment used to generate the PRB is generally permeable as or more permeable than the surrounding material, encouraging impacted groundwater to flow through the reactive material. The reactive material then causes chemical reactions to occur, resulting in adsorption, precipitation, or degradation of the COC. PRBs are commonly used to control organic contamination in groundwater and have been successfully used to remediate metals.
Closure in Place (CiP) (of the regulated unit)	Landfill caps can be installed to minimize generation of leachate and to minimize infiltration into underlying waste. Landfill caps also may be applied to waste masses that are so large that other treatment is impractical. By providing a suitable base for the establishment of vegetation. In conjunction with water diversion and detention structures, landfill caps may be designed to route surface water away from the waste area while minimizing erosion
Closure by Removal (CbR) (of the regulated unit)	Removal of contaminated media for disposal in off-site facility or alternate on-site facility. Media would likely require characterization for proper disposal. Pre-treatment may be necessary to meet land disposal restrictions (LDRs). Once excavated, confirmatory samples would be collected to verify clean-up criteria have been met; the excavation would then be backfilled and covered.

References: Technology descriptions referenced from 1) FRTR: Federal Remediation Technologies Roundtable, CLU-IN, and/or AECOM reference materials.

A1.2 Other Source Control Technologies

In addition to the groundwater corrective measures technologies summarized above, CCR impacts are also mitigated through a variety of engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods for source control.

A1.3 No Action

No Action is included in the evaluation as a baseline against which other technologies are evaluated. With this option, no corrective action would be taken to remove, control, mitigate or minimize exposure to impacted media. In the event that the other identified alternatives do not offer substantial benefits, No Action is the default baseline approach.

Under this alternative, existing impacted media (i.e., CCR materials and impacted soil/groundwater along the exposure pathway) would remain. No capital costs would be incurred, and no cleanup standards would be considered.

No Action does not meet the performance requirement of attaining the established Corrective Action Objective (CAO). Although implementation would be very easy, the required state approval for "No Action" would likely not occur. Safety impacts, cross-media impacts, and residual CCR exposure control

would be no different from current conditions. Therefore, No Action is not an appropriate standalone technology. However, it is retained for use as a baseline against which other technologies and alternatives are evaluated.

A1.4 Institutional Controls (ICs)

The potential use of ICs is considered the least aggressive corrective action technology for CCR impacts.

ICs would not change the concentration or mobility of COCs and therefore would not meet the performance requirement of attaining the established CAO as a standalone technology unless it can be demonstrated that impacted groundwater is not leaving the facility. ICs would be used in combination with other corrective measures to limit human exposures and would be easy to implement, consisting of preparation and recording of Environmental Restrictive Covenants [ERC(s)]. Safety impacts and cross-media impacts would be identical to current conditions. Because ICs would control exposure and thus enhance protection of human health and the environment, the use of ICs can be a component of corrective measures alternatives. The use of ICs as a standalone technology will not be considered.

A1.5 Groundwater Monitoring

The use of groundwater monitoring is only applicable for dissolved-phase groundwater impacts, and it will take place in Assessment and/or Detection modes as appropriate for the current phase of CCR activity. Groundwater monitoring is not a standalone technology, but instead will be combined with other remedial technologies in order to track progress of the overall remedy, which also incorporates natural attenuation processes.

The use of groundwater monitoring as a stand-alone remedial technology will not be considered; instead the incorporation of groundwater monitoring in conjunction with other technologies will be used to monitor effectiveness of a given corrective measures alternative to attain the CAO at points immediately downgradient over an extended period of time. Data reliability is controlled by adherence to the site's groundwater monitoring plan. Implementation of the existing groundwater monitoring plan is easy because it is currently underway. Safety impacts are minimized by use of the existing Health and Safety Plan and there are no construction activities required. There are no cross-media impacts or institutional requirements, nor is there any residual CCR exposure control.

A1.6 Hydraulic Containment

The use of hydraulic containment as a potential remedial technology is considered. The use of groundwater extraction can be effective at hydraulically controlling long-term downgradient dissolved phase impacts.

Hydraulic containment through groundwater extraction and subsequent treatment has historically been a common method for management of groundwater impacted with metals and other inorganics. Groundwater is pumped from wells (vertical or horizontal) or collection trenches to a discharge point (e.g., a permitted outfall) or to an aboveground treatment system. The extraction network would be designed, constructed, and operated to provide a hydraulic barrier between the impacted groundwater and the migration pathway to potential receptors.

This technology attains the established CAO because hydraulic containment rapidly eliminates the offsite migration of impacted groundwater, thereby eliminating the exposure pathway. Performance and reliability would be controlled by adherence to the operations and maintenance plan prepared for the extraction and treatment systems. Implementation would be difficult because of areas of limited access for drilling equipment and uneven groundwater flow in the uppermost aquifer materials that consist of interbedded sandstone and shale having hydraulic conductivity values spanning several orders of

magnitude. Potential safety impacts during construction, operation, and maintenance of the system would be mitigated by health and safety plans prepared for these tasks. There would be no cross-media impacts. Hydraulic containment will reduce mobility due to COCs capture provided by the groundwater extraction system and treatment to remove COCs from the environment. The time period for CAO attainment may be relatively short, but system operation will need to continue until CCR source loading of COCs to groundwater ceases. For institutional requirements, treated discharge would occur under existing or modified National Pollution Discharge Elimination System (NPDES) permit.

Based on the preliminary screening, hydraulic containment is a potentially viable remedial technology and will be retained for further consideration.

A1.7 Physical Containment

The use of physical containment to isolate the impacted materials associated with a CCR unit is considered. Physical containment typically consists of a barrier or wall (i.e., slurry wall, sheet pile wall, or injection grouting) constructed below the ground surface to control or restrict the flow of groundwater. The barrier is typically constructed by excavators and/or deep trenching equipment that thoroughly mix bentonite/cement slurry to create a homogenized impermeable wall, or by driving sheet pile. The construction of the barrier would prevent impacted groundwater from flowing downgradient. Where possible, the bottom of the barrier would be keyed into the low-permeability soil or bedrock (confining layer) at the bottom of the aquifer, keeping groundwater from seeping beneath it. To provide hydraulic control of the impacted groundwater behind the barrier and prevent impacted water from flowing around the edges, a hydraulic containment system would be installed behind the wall. Extracted groundwater would then be discharged or processed through a groundwater treatment system, as needed. Extraction flow rates for this option will generally be lower than in a standalone hydraulic containment option, because the pumping rates will only need to accommodate natural groundwater flow rates, rather than providing a hydraulic barrier. However, pumping would need to be performed indefinitely to maintain water levels behind the barrier. It is also noted that physical barriers can also be utilized in a funnel-and-gate arrangement to direct the flow of groundwater to a small, more permeable area (i.e., the gate) where reactive material can be used to treat the metals in-situ. The "gate" can also be configured as a single extraction point for impacted groundwater directed to it by the "funnel."

This technology attains the established CAO after combined physical and hydraulic containment eliminates the offsite migration of impacted groundwater, thereby eliminating the exposure pathway. In the long term, this technology will maintain compliance with the established CAO after final cover construction at the Green Landfill, which will end the source loading to the groundwater, and groundwater flushes through the aquifer. Performance and reliability would be controlled by adherence to the operations and maintenance plan prepared for the extraction and treatment systems. The technology would pose substantial challenges to the installation and operation of the physical barrier such as areas of limited access and highly variable depths to bedrock. Potential safety impacts during construction, operation, and maintenance of the system would be mitigated by health and safety plans prepared for these tasks. Cross-media impacts include the potential for airborne fugitive dust issues during construction, which would be mitigated by construction contingency planning. The time period for attainment is based on construction of the barrier. For institutional requirements, treated discharge would occur under existing or modified NPDES permit.

Based on the preliminary screening, physical containment is potentially viable as a potential corrective measures alternative component when combined with supplemental groundwater extraction and treatment. However, physical containment does not appear to add value to a stand-alone hydraulic containment approach.

A1.8 Ex-Situ Physical/Chemical/Biological Treatment

Ex-situ treatment requires the use of groundwater extraction with related engineering, equipment, permitting, and material handling necessary to convey the waste stream to above-ground treatment. Treatment technologies would be designed to remove the specific constituents from groundwater to meet regulatory discharge requirements; treatment options for the varied constituents may include pH adjustment, filtration, coagulation/chemical precipitation, membrane filtration, ion exchange, carbon adsorption, reverse osmosis, chemical reduction, and other potential treatment technologies. Multiple treatment technologies would potentially be needed to effectively remove the different types of contaminants. If this technology is incorporated into a corrective action alternative, further detailed evaluation and/or bench- and pilot-scale studies would be necessary to identify technically effective treatment technologies given the inorganic COCs.

This is not a standalone technology, but would be used in combination with hydraulic containment. System reliability would be controlled by adherence to an operation and maintenance plan prepared for the system. Implementation is expected to be straightforward based on well-established water treatment principles and experience. Potential safety impacts during construction, operation, and maintenance of the system would be mitigated by health and safety plans prepared for these tasks. There would be no cross-media impacts, nor would there be exposure to residual CCR materials. The time period for attainment is based on performance of the overall corrective measure, of which ex-situ treatment would be a component. For institutional requirements, treated discharge would occur under existing or modified NPDES permit.

Based on the preliminary screening, ex-situ treatment is a potentially viable remedial technology and will be retained for further consideration.

A1.9 In-Situ Physical/Chemical/Biological Treatment

For the inorganic COCs at CCR sites, in-situ treatment involves enhancement of natural attenuation processes such as dilution, adsorption, and chemical reactions to reduce concentrations to acceptable levels. This technology is appropriate for sites in which groundwater flow volumes are low, source controls are effective, and impacted groundwater is not expected to be long-lived.

Lithium (Li) is the sole COC for the Assessment of Corrective Measures (ACM) at the Green Landfill, and in-situ treatment methods are ineffective for Li. Therefore, this technology will not meet the performance requirement, and it will not be retained for further consideration.

A1.10 Permeable Reactive Barriers (PRB)

A PRB is an in-situ treatment method consisting of subsurface trench filled with reactive material installed to intercept and react with impacted groundwater. PRBs can be established through direct-push injection (on closely spaced grids) or emplaced as a continuous trench of reactive material. PRBs are typically installed to the depth of impacted groundwater (often the bottom of the shallow aquifer) and are oriented perpendicular to the flow of impacted groundwater. The amendment used to generate the PRB is generally as permeable as or more permeable than the surrounding material, encouraging impacted groundwater to flow through the reactive material. The reactive material then causes chemical reactions to occur within the PRB, resulting in adsorption, precipitation, or degradation.

PRBs are commonly used to control organic contamination in groundwater, and have been successfully used to remediate some metals. However, because Li is the sole COC for the ACM at the Green Landfill,

and in-situ methods are ineffective for Li, PRB will not meet the performance requirement, and it will not be retained for further consideration.

A1.11 Closure-in-Place (CiP) [of the regulated unit]

CiP would entail capping and restoration of the unit that contains the CCR material. Capping would minimize infiltration into the CCR material, thereby minimizing the potential for leachate to impact underlying soil and shallow groundwater. Capping would reduce potential exposure pathways and thus enhance protection of human health and the environment.

CiP will help attain the established CAO after final cover construction ends the source loading to the groundwater, and impacted groundwater flushes through the aquifer. This technology is easily implemented, as CiP is required by conditions of the solid waste permit and re-design of the southern storm water pond requires nominal engineering and construction efforts. Potential safety impacts during construction, operation, and maintenance of the final cover are governed by conditions of the solid waste permit and are mitigated by health and safety plans prepared for these tasks. There are no cross-media impacts associated with CiP, and it will provide for significant reduction in mobility of COCs upon implementation of the CiP source control. Final cover for the Green Landfill is anticipated as part of facility operations. Institutional requirements will consist of solid waste permit renewal(s) and state and community acceptance of the final remedy.

Based on the preliminary screening, CiP is retained for further consideration.

A1.12 Closure by Removal (CbR) [of the regulated unit]

CbR is a proven remedy that can effectively remove the source of contamination. The excavation of impacted CCR material would typically be completed using standard construction equipment (e.g., backhoe, excavator, wheel loader, dump trucks). The excavated materials are then placed directly into dump trucks for transport/disposal or beneficial use. Excavation limits would typically be verified with confirmation sampling to demonstrate that the underlying soil is not impacted above applicable standards.

This technology would help attain the established CAO after CCR removal ends and the source loading to groundwater is eliminated. This technology would be difficult to implement, because of the large-scale construction effort required and resulting disruption to station operations and community impact. Potential safety impacts during excavation and backfilling would be mitigated by health and safety planning. However, the volume of truck traffic for waste and fill hauling would be a significant community safety issue. Potential airborne fugitive dust issues during excavation and hauling would be significant, but would be mitigated by construction contingency planning. CbR will eliminate exposure through removal of the CCR. CbR would begin following state and community approvals, and duration of excavation activities is anticipated to be many years. In addition to state and community acceptance of the proposed remedy, excavation and backfilling may require local building permits and local municipality input and approval. Excavation dewatering discharge would occur under existing or modified NPDES permit.

Based on the preliminary screening, CbR is retained for further consideration.

A1.13 Screened Corrective Measures Technologies Summary

A summary of the results of the corrective measures technologies screening is presented below in **Table A2**. The design and specific application of the retained technologies, either as stand-alone or part of a treatment train, will be crucial in the success of the corrective action.

Table A2 – Screened Corrective Measures Technologies

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as standalone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established CAOs.
Institutional Controls (ICs)	Retained as supplement to corrective measures alternatives	The use of ICs (i.e., Environmental Covenant, groundwater use restrictions, etc.) is retained as a useful technology. However, it is noted the ICs are not anticipated to be used as a stand-alone technology. Environmental Covenants, groundwater use restrictions, etc., are expected to be combined with other applicable technologies as part of corrective measures alternatives.
Groundwater Monitoring (Assessment and Detection mode)	Retained as supplement to corrective measures alternatives	The use of groundwater monitoring (Assessment and/or Detection modes as appropriate) when combined with other applicable technologies as part of any proposed corrective measures alternative is retained to address the CAO and to track the effectiveness of the overall remedy. However, it is not retained as a standalone technology.
Hydraulic Containment	Retained	The use of hydraulic containment is retained because it is an effective means of preventing offsite migration of soluble contaminants. Hydraulic containment requires management and potential ex-situ treatment of extracted groundwater, so it is not a stand-alone technology. The Conceptual Site Model (CSM) will guide the design of any groundwater extraction system to optimize the total discharge of groundwater needed to provide hydraulic containment.
Physical Containment	Retained	The use of physical containment is retained because it can be an effective means of managing groundwater flow. Physical containment often requires pairing with hydraulic containment and/or in-situ treatment (funnel and gate style) to manage the flux of groundwater flow into the system. The CSM will guide the design of any physical barrier system, but technology limitations increase the difficulty with scale.
Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment technologies are retained as a way of removing contaminants from extracted groundwater from a hydraulic containment system. Ex-situ treatment may be paired with wastewater treatment, non-groundwater release treatment systems, or with permitted discharge to manage groundwater contamination. The CSM and data gaps investigations will guide the design of any ex-situ treatment
In-situ Physical/Chemical Treatment	Not Retained	In-situ treatment technologies are ineffective for the Li

Potentially Applicable Technology	Status	Description/Overview
Permeable Reactive Barriers (PRB)	Not Retained	The use of PRBs is not retained because in-situ treatment technologies are ineffective for Li.
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.
Other Source Control Technologies	Retained	Control of source area non-groundwater related releases. For the purposes of this groundwater ACM, management of non-groundwater releases are not included in the alternatives evaluation. Engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods are regarded as part of closure technologies selected by other means.

References: Technology descriptions referenced from 1) FRTR: Federal Remediation Technologies Roundtable, CLU-IN, and/or AECOM reference materials.

A2.0 CORRECTIVE MEASURES ALTERNATIVES

Corrective measures technologies from the initial screening and evaluation (see **Table A2**) were utilized to create corrective measures alternatives. Professional judgment was used to assemble technically efficient pairings of technologies for each corrective measures alternative in consideration of the range of site-specific COCs and concentrations.

The corrective measures alternatives typically incorporate the use of technologies that will require additional investigation needed to 1) finalize the alternative selection, 2) delineate the assumed corrective action areas, 3) provide for full-scale cost estimation and design, and 4) demonstrate alternative efficacy. To this end, data gaps will be identified and addressed as needed.

It should be emphasized that the technology screening and alternatives assembly employed for this ACM is qualitative in nature. The formal remedy selection process, in accordance with the CCR Rule 40 CFR Section 257.97, will begin following submission of the ACM Report. The subsequent remedy selection process will evaluate the following objectives for remedies, as required under Section 257.97(b):

- Protect human health and the environment;
- Attain the COC-specific GWPS as specified pursuant to Section 257.95(h);
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents 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 (applicable to material releases only); and
- Comply with standards for management of wastes as specified in Section 257.98(d).

Assessment of Corrective Measures Non-Groundwater Releases Under the CCR Rule

**GREEN STATION CCR LANDFILL
GREEN STATION
WEBSTER COUNTY, KENTUCKY**

June 28, 2019

Prepared For:

**Big Rivers Electric Corporation
Sebree Generating Station
9000 Highway 2096
Robards, Kentucky 42452**

Prepared by:

AECOM

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Job Number: 60602364

CONTENTS

Section	Page
ACRONYMS	ii
EXECUTIVE SUMMARY	1
1.0 INTRODUCTION.....	4
2.0 DESCRIPTION OF CURRENT CONDITIONS	5
2.1 Site Background.....	5
2.2 Site Investigation and Interim Measures.....	5
2.2.1 River Seeps.....	5
2.2.2 Perimeter Seeps	13
3.0 CORRECTIVE ACTION OBJECTIVE (CAO).....	16
3.1 Assessment of Interim Corrective Measure Ability to meet CAO	16
4.0 TECHNOLOGY IDENTIFICATION	17
5.0 REFERENCES.....	19

List of Tables

1. July 2018 River Seep Sampling Results
2. April 2019 Northwest Seep Sampling Results
3. July 2018 Perimeter Seep Sampling Results
4. Potential Corrective Measures Options Technology Description/Overview

List of Figures

1. Site Location Map
2. Monitoring Well and Seep Location Map

List of Appendices

- A. Technical Memorandum – River and Seep Sampling and Analysis, September 6, 2018
- B. Supplemental Boring Logs and Cross-Sections
- C. Northwest Seep Laboratory Analytical Results
- D. Landfill Perimeter Seeps Laboratory Analytical Results

ACRONYMS

ACM	Assessment of Corrective Measures
AECOM	AECOM Technical Services, Inc.
As	Arsenic
BREC	Big Rivers Electric Corporation
CAO	Corrective Action Objectives
CbR	Closure by Removal
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
CiP	Closure in Place
ft. amsl	Feet above mean sea level
KAR	Kentucky Administrative Regulations
KDoW	Kentucky Division of Water
KPDES	Kentucky Pollution Discharge Elimination
mg/L	Milligrams per liter
PRB	Permeable Reactive Barrier
TDS	Total Dissolved Solids
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

AECOM Technical Services, Inc. (AECOM) was retained by Big Rivers Electric Corporation (BREC) to prepare an Assessment of Corrective Measures (ACM) to identify appropriate supplemental corrective measures for non-groundwater impacts from coal combustion residuals (CCR). The subject non-groundwater impacts are associated with seeps that are impacted from CCR that has been historically managed within the Green Station CCR Landfill (Green Landfill) at the Sebree Generating Station (Sebree Station), located near Sebree, Kentucky.

Pursuant to Title 40 of the Code of Federal Regulations (CFR) parts 257.90(d) and 257.84(b)(5), BREC initiated design of containment systems intended to reduce and prevent non-groundwater releases from reaching the Green River as an interim corrective measure. Plans for these measures have been submitted to the Kentucky Energy and Environment Cabinet (Cabinet) for review and comment. The Cabinet has adopted the federal CCR Rule by reference in Title 401 of the Kentucky Administrative Regulations (KAR) Chapter 46:110. Contracting for that work is complete and construction is scheduled to commence in 2019. This ACM is considering and evaluating whether additional remedial measures, that would be supplemental to the interim measures already planned, are warranted to address non-groundwater surface seeps. This ACM is also being coordinated with the ACM for groundwater at the facility.

The United States Environmental Protection Agency (USEPA) is in the process of clarifying the extent to which the assessment of corrective measures provisions of 40 CFR 257.96 apply to surface seeps. Specifically, USEPA announced in a litigation settlement it would remand for further comment the provision in the CCR Rule requiring entities to implement the rule's corrective action requirements for non-groundwater "releases" from CCR units. USEPA has proposed, but has not finalized, amendments to the rule to clarify the type and magnitude of non-groundwater releases that would require a facility to comply with some or all of the corrective action procedures in the CCR rule. USEPA confirmed that while the rule's general obligation to respond to releases from CCR units remains in place, the settlement sends a clear message that not all non-groundwater releases are subject to the rule's corrective action provisions and that the scope of non-groundwater releases subject to the rule's corrective action requirements will be resolved in the future rulemaking.

Consistent with USEPA guidance and 40 CFR 257.90(d) and 257.84(b)(5), BREC has, as noted above, proceeded with an initial containment project consisting of collection trenches, which have been designed, with the designs submitted to the Cabinet for review. Following additional seep sampling conducted in December 2018, BREC is also preparing this supplemental ACM to outline the potentially applicable remedial technologies should the interim corrective measures be insufficient to meet the corrective action objectives. This ACM is being presented even though the CCR Rule is not clear as to whether an ACM is required in these circumstances and the reconsideration rule has not been finalized.

Two types of non-groundwater releases have been identified through inspection and investigation of the site: river seeps and perimeter seeps. The occurrence and chemistry of the seeps was evaluated through observation and sampling as reported in memoranda and analytical reports appended herein. The character of the seepage water was compared to Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure identified in 401 KAR 10:031 Section 6. The samples largely exceeded the criteria for chloride, which became the basis for further investigation and corrective measures. Interim corrective measures to eliminate these non-groundwater seeps have been planned and are under way.

Because of their positions along the water ways where access is restricted, the river seep corrective measures involve the installation of interceptor trenches to capture seepage and route it to discharge via Kentucky Pollution Discharge Elimination (KPDES) permit. The river seep areas to be captured cover the

eastern seepage area adjacent to the Green River between monitoring wells MW-2 and MW-3A, and the northwestern seepage area located adjacent to ditch discharging to the Green River. These measures will commence in 2019, and are scheduled to be completed by the end of the year.

Perimeter seeps corrective measures similarly involve the containment and routing of seepage to permitted discharge, but because they are accessible at the surface, they are amenable to simple piping and ditch lining approaches. The perimeter seeps will be routed either to the North Pond, which will then discharge to the Green Surface Impoundment (KPDES Outfall 009), or the South Pond (KPDES Outfall 012), which will also be routed to the Green Surface Impoundment. The corrective measures will include cleaning and re-design of the South Pond to remove residual CCR material and to create lined sumps on either end to manage the seepage water separately from storm water. The corrective measures for the perimeter seeps are being coordinated with corrective measures to address groundwater impacts at the facility, which are discussed under a separate ACM for groundwater impacts (AECOM, June 13, 2019).

If the interim corrective measures currently under way are not adequate to meet the corrective action objectives, then the assessment of potential technologies identified herein, which follows the requirements of 40 CFR 257.96, will be reconsidered. 40 CFR 257.96(c) requires an ACM to include an analysis of the effectiveness of potential corrective measures in meeting the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

- (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).

Several potential corrective measures technologies were evaluated in order to identify which ones could be carried forward as components of corrective measures alternatives. The results of the corrective measures technology evaluation are presented below:

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as stand-alone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established CAOs.
Hydraulic Containment	Retained	Hydraulic containment in the form of pumping of vertical or horizontal wells would potentially be used to provide spot control of seepage if the interim corrective measures are unable to fully capture the seepage.
Physical Containment	Retained	Physical containment in the form of a cutoff wall would potentially be used to re-direct or otherwise intercept seepage that was not adequately captured by the interim corrective measures.

Green Station CCR Landfill
 Assessment of Corrective Measures

Potentially Applicable Technology	Status	Description/Overview
Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment is retained as a potential supplement to the interim corrective measures in the event that discharge via the station's KPDES permit is not possible.
In-situ Physical/Chemical Treatment	Retained	In-situ treatment is retained in the form of spot treatment or fixation of seepage areas in the event that the interim corrective measures do not adequately address all seepage areas.
Permeable Reactive Barriers (PRB)	Retained	The use of PRBs is retained in the form of a reactive cell in the event that interim measures result in seepage concentrations that require pre-treatment in-situ prior to discharge.
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.
Other Source Control Technologies	Retained	Control of source area non-groundwater releases is being implemented as interim corrective measures but is retained in the event that interim measures need to be evaluated for expansion.

1.0 INTRODUCTION

The following report presents the Assessment of Corrective Measures (ACM) for non-groundwater impacts identified at the Big Rivers Electric Corporation (BREC) Green Station CCR Landfill (Green Landfill) at the Sebree Generating Station (Sebree Station) located near Sebree, Kentucky. The Green Landfill is identified as a coal combustion residuals (CCR) unit under the requirements of the United States Environmental Protection Agency (USEPA) regulations in Title 40 of the Code of Federal Regulations (CFR) Part 257 (CCR rule). The subject non-groundwater impacts are from surface seeps that are impacted by CCR constituents and that are not currently controlled by the station's Kentucky Pollution Discharge Elimination System (KPDES) permit.

Pursuant to 40 CFR 257.90(d) and 257.84(b)(5), BREC initiated design of containment systems intended to reduce and prevent non-groundwater releases from reaching the Green River as an interim corrective measure. Plans for these measures have been submitted to the Kentucky Energy and Environment Cabinet (Cabinet) for review and comment. The Cabinet has adopted the federal CCR Rule by reference in Title 401 of the Kentucky Administrative Regulations (KAR) Chapter 46:110. Contracting for that work is complete and construction is scheduled to commence in 2019. This ACM is considering and evaluating whether additional remedial measures, that would be supplemental to the interim measures already planned, are warranted to address non-groundwater surface seeps. This ACM is also being coordinated with the ACM for groundwater at the facility.

The United States Environmental Protection Agency (USEPA) is in the process of clarifying the extent to which the assessment of corrective measures provisions of 40 CFR 257.96 apply to surface seeps. Specifically, USEPA announced in a litigation settlement it would remand for further comment the provision in the CCR Rule requiring entities to implement the rule's corrective action requirements for non-groundwater "releases" from CCR units. USEPA has proposed, but has not finalized, amendments to the rule to clarify the type and magnitude of non-groundwater releases that would require a facility to comply with some or all of the corrective action procedures in the CCR rule. USEPA confirmed that while the rule's general obligation to respond to releases from CCR units remains in place, the settlement sends a clear message that not all non-groundwater releases are subject to the rule's corrective action provisions and that the scope of non-groundwater releases subject to the rule's corrective action requirements will be resolved in the future rulemaking.

Consistent with USEPA guidance and 40 CFR 257.90(d) and 257.84(b)(5), BREC has, as noted above, proceeded with an initial containment project consisting of collection trenches, which have been designed, with the designs submitted to the Cabinet for review. Following additional seep sampling conducted in December 2018, BREC is also conducting this supplemental ACM to outline the potentially applicable remedial technologies should the interim corrective measures be insufficient to meet the corrective action objectives. This ACM is being presented even though the CCR Rule is not clear as to whether an ACM is required in these circumstances and the reconsideration rule has not been finalized.

As described in Section 2, the character of seeps has been identified through a series of investigations and interim corrective measures have been planned and are underway. Section 3 provides a description of the corrective action objective (CAO), while Section 4 provide a list of potential technologies. If the interim corrective measures currently under way are not adequate to meet the corrective action objectives, then an assessment of potential technologies that follows the requirements of 40 CFR 257.96 will be performed.

2.0 DESCRIPTION OF CURRENT CONDITIONS

This section provides information related to the current use of the Site, as well as the history of activities relevant to the non-groundwater ACM for the Green Landfill at Sebree Station.

2.1 Site Background

BREC owns and operates Sebree Station, which is a coal-fired power generating facility located on the Green River northeast of Sebree, Kentucky. Sebree Station is composed of Green Station and Reid/HMPL Station. The Sebree Station is bounded by Interstate-69 to the west and the Green River to the east (**Figure 1**). Reid Unit 1 (66 Megawatts) began commercial operation in 1966 and it will be converted from coal to natural gas in the future. The Reid Combustion Turbine (72 MW) was commercialized in 1976. HMPL Station 2, Units 1 (167 MW) and 2 (168 MW) began commercial operation in 1973 and 1974, respectively. Both HMP&L units were retired as of February 1, 2019. Green Station Units 1 (242 MW) and 2 (242 MW) began commercial operation in 1979 and 1981, respectively.

The location of the Green Landfill is illustrated on **Figures 1 and 2**. The Green Station CCR Landfill (Green Landfill) is located directly south of Sebree Station, situated south of the Green Station CCR Surface Impoundment. The Green Landfill is a Kentucky permitted landfill (Permit No. SW11700007) that currently receives special wastes generated by burning coal (CCRs) from Green Station. The landfill began receiving CCR wastes in 1980. The current Green Landfill footprint is approximately 170 acres.

The original ground surface within the landfill footprint was irregular and the dominant features were small stream valleys draining towards the Green River, which is located just east of the landfill; and towards Groves Creek, which is located just south of the landfill. There was also historic oil and gas production at and in the immediate vicinity of the Green Landfill. A review of the records from the Kentucky Geological survey showed that at or immediately adjacent to the Site, there were a number of dry exploratory oil/gas exploration holes, oil production wells, one gas production well, and one secondary recovery injection well. There were also former brine ponds at the Site. Most of these wells were abandoned in accordance with applicable regulations by BREC in 1997 and 1998. The last existing well was decommissioned in 2019.

2.2 Site Investigation and Interim Measures

Two types of non-groundwater releases have been identified through inspection and investigation of the site: river seeps and perimeter seeps as discussed below.

2.2.1 River Seeps

The river seeps are those found along the Green River and its tributary streams. Seeps have been observed on the bank of the river, on the slope between the river and the landfill perimeter road, and adjacent to a tributary stream on the northwest side of the Landfill.

Green River Seeps

An investigation of the river seeps was conducted in July 2018 as reported in a technical memorandum from AECOM to BREC dated September 6, 2018 (**Appendix A**). In this investigation, the banks of the Green River were surveyed by boat for evidence of seepage. Samples of seeps having visible flow were collected and tested for CCR indicator parameters (40 CFR 257 Appendix III), CCR constituents of concern (40 CFR 257 Appendix IV), and general chemistry parameters. The data from these analyses were used to evaluate whether individual seeps were likely associated with the Landfill. Three seeps

(RS-05, RS-07, and RS-08 as illustrated on **Figure 2**) were found to be similar to the chemistry of the Landfill (see **Table 1** below). Seeps RS-05 and -07 are located near the center of the Landfill between monitoring wells MW-2 and MW-3A. This is the same area in which seeps have been observed higher on the slope between the river and the perimeter road, suggesting that they have a similar origin. Seep RS-08 is located adjacent to the South Pond and appears to be tied to that unit.

The results of river seep sample testing were compared to Kentucky Water Quality criteria for warm water aquatic habitat identified in 401 KAR 10:031 Section 6. Where there are no Kentucky Water Quality criteria for a specific constituent, the USEPA Region 4 surface water screening values are listed for comparison. The Region 4 screening values are not compliance criteria, but rather values used to determine whether further evaluation is warranted. Samples from RS-05, -07 and -08 were found to exceed the 600 milligrams per liter (mg/L) limit for chloride. RS-05 also exceeded the current criteria for cadmium (0.00029 mg/L) and lead (0.0036 mg/L), but Kentucky has introduced a new cadmium criteria that may bring RS-05 back into compliance. Follow-up sampling conducted in December 2018 by KDEP and BREC confirmed the exceedance of the chloride criteria. Accordingly, this parameter (chloride) is regarded as the primary basis for further investigation and interim action.

The analytical results for the river seep samples are summarized in **Table 1** below. Presented in parallel with the river seep results are deep instream river samples that were collected immediately adjacent to the river seeps to characterize the river water quality that is most likely to be impacted by seepage. The deep samples were collected within 1 foot of the river bed within 3 to 5 feet of the water line. None of the river sample results exceed the water quality or screening criteria.

Options for interim measures were evaluated based on the site topographic setting, the character of the seepage, jurisdictional restrictions around the waterway, and operational logistics. Interception by french drain was selected as the most feasible and effective solution.

To evaluate the logistics of french drain installation, two investigations were conducted to probe the subsurface along in the area between the landfill and the river, creating a profile of the affected subsurface materials. The results of these investigations are in the form of boring logs and a cross section presented in **Appendix B**. These data indicate that the seepage occurs along a specific horizon 3.5 to 26 feet below the perimeter road surface. Accordingly, the french drain has been designed to intercept that horizon across the area of seepage, which covers roughly 1,000 feet between MW-2 and MW-3A. Contractors capable of installing the trench and appurtenant features have been identified and are being contracted for implementation of this interim measure in 2019. The drain is designed to intercept the seepage, thereby eliminating the source of the non-groundwater release. The intercepted water in the collector pipe at the base of the gravel-filled trench will be pumped to a collection sump and conveyed by underground pipe to the Green Surface Impoundment for disposal under the station's KPDES permit.

Table 1 – July 2018 River Seep Sampling Results

Parameter	Water Quality/Screening Criteria (mg/L) ¹	Laboratory Analytical Results (mg/L or pCi/L where noted)					
		RS05	R03B	RS07	R02B	RS08	R01B
Appendix III Constituents							
Boron	7.2 ^b	0.853 J	0.0235 J	1.46	0.0322 J	0.510 J	0.0252 J
Calcium	116 ^b	916	32.6	1120	35.8	801	33.2
Chloride	600 ^c	1670	5.59	1990	6.69	2040	4.52
Fluoride	2.7 ^b	0.0795 J	0.0954 J	0.102J	0.0979 J	0.0915 J	0.105 J
Sulfate	NE ^e	1170	28.9	1480	30.1	1440	28.3
TDS ^a	NE ^e	5140	170	6080	170	5310	161
Appendix IV Constituents							
Antimony	0.19 ^b	0.000366 J	0.000514 J	<0.000002	0.00106 J	0.00141 J	0.000476 J
Arsenic	0.15 ^c	0.0192	0.00131 J	0.00182 J	0.00135 J	0.000404 J	0.00137 J
Barium	0.22 ^b	0.718	0.0362 J	0.0605 J	0.0396 J	0.0443 J	0.0374 J
Beryllium	0.011 ^b	0.000545 J	<0.002	<0.000002	<0.002	<0.002	<0.002
Cadmium	0.00029 ^{d, 1}	0.000563 J	<0.001	<0.000001	<0.001	<0.001	<0.001
Chromium III/VI	0.074/0.011 ^b	0.0124	0.00119 J	0.000340 J	0.00155 J	0.000560 J	0.00143 J
Cobalt	0.019 ^b	0.0327	0.0008 J	0.0218	0.000937 J	0.000691 J	0.000623 J
Fluoride	2.7 ^b	0.0795 J	0.0954 J	0.102 J	0.0979 J	0.0915 J	0.105 J
Lead	0.0036 ^d	0.0104	0.00166 J	0.000523 J	0.00199 J	0.000769 J	0.006
Lithium	0.44 ^b	0.340	<0.05	0.772	<0.05	1.80	<0.05
Mercury	0.00077 ^c	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	0.8 ^b	0.00442 J	0.00103 J	0.00219 J	0.00145 J	0.00296 J	0.0013 J

Note: Table continued on the following page

Table 1 – July 2018 River Seep Sampling Results (cont.)

Parameter	Water Quality/Screening Criteria (mg/L) ¹	Laboratory Analytical Results (mg/L or pCi/L where noted)					
		RS05	R03B	RS07	R02B	RS08	R01B
Radium 228	NE ^e	3.83 pCi/L	-0.197 pCi/L	0.831 pCi/L	0.417 pCi/L	0.983 pCi/L	-0.00993 pCi/L
Radium 226+228	NE ^e	7.64 pCi/L	0.391 pCi/L	1.4 pCi/L	0.735 pCi/L	1.31 pCi/L	0.249 pCi/L
Selenium	0.005 ^c	0.00121 J	<0.01	<0.01	0.000636 J	<0.01	<0.01
Thallium	0.006 ^b	0.000164 J	<0.001	<0.001	<0.001	<0.001	<0.001

Notes:

1. Where a Kentucky Water Quality Criteria has not been adopted for a specific constituent, USEPA Region 4 Surface Water Screening Values are listed for comparison.
- a. TDS = total dissolved solids
- b. USEPA Region 4 Surface Water Screening Values for freshwater chronic exposure, updated August 2015.
- c. Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure (401 KAR 10:031)
- d. Calculated Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure using a water hardness value of 110 mg/L. (401 KAR 10:031)
- e. NE = not established.
- f. The Kentucky Water Quality Criteria for cadmium under 401 KAR 10:031 have been proposed for amendment under the 2018 Triennial Review by KDEP.
- J The analytical result is less than the reporting limit but greater than the method detection limit and is an approximate value.

Shaded cells = A result above Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure

Bold Text = A results above USEPA Region 4 Surface Water Screening Values

Northwest Seep

In April 2019, inspection of the Landfill site by the Kentucky Division of Waste Management and Kentucky Division of Water (KDoW) identified an area of seepage outside the perimeter road on the northwest side of the Landfill (See **Figure 2**). This seepage (herein identified as the NW seep) is adjacent to a ditch that flows eastward to an unnamed outfall for which a KPDES discharge permit has been applied for. The outfall was sampled by KDoW and BREC on April 2, 2019. The laboratory results from the April 2, 2019 sampling event are presented in **Appendix C** and summarized below in **Table 2**. A sample from this seep area (identified as sample 023) was collected by BREC personnel on April 11, 2019. The laboratory results from the April 11, 2019 sampling event are presented in **Appendix C** and summarized below in **Table 2**. The results indicate that the seep sample exceeded Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure for chloride and cadmium (until the proposed cadmium criteria is adopted as noted in Section 2.1 above). Therefore, the area will be subject to interim corrective measures.

The NW seep appears to be emanating from a horizon in or above a natural limestone ledge adjacent to the ditch (see photographs below on the following pages). This conclusion is based on the observation of natural springs of groundwater upstream from the seep that clearly flows from fractures in the ledge. A series of three soil borings drilled between the landfill and the NW seep area in May 2019 further suggest the seepage is controlled by this feature.

A trench drain similar to the interim measure being designed for the east side of the Green Landfill was selected as the most feasible and effective interim solution. Accordingly, the trench drain is being designed for implementation in 2019. The trench will be backfilled with gravel and constructed with a sump to pump the intercepted water for underground conveyance to the Green Surface Impoundment for discharge under the station's KPDES permit. Interception via the drain is expected to eliminate this discharge of impacted seep water.

Table 2 – April 2019 Northwest Seep Sampling Results

Parameter	Water Quality/Screening Criteria (mg/L) ¹	Laboratory Analytical Results (mg/L or pCi/L where noted)	
		023 April 11, 2019	SW-Culvert-1 April 2, 2019
Appendix III Constituents			
Boron	7.2 ^b	0.626 J	<1.0
Calcium	116 ^b	488	203
Chloride	600 ^c	864	344
Fluoride	2.7 ^b	0.0356 J	<0.2
Sulfate	NE ^e	548	401
TDS ¹	NE ^e	2850	Not analyzed
Appendix IV Constituents			
Antimony	0.19 ^b	0.0000690 J	<0.005
Arsenic	0.15 ^c	0.000759 J	<0.01
Barium	0.22 ^b	0.0557 J	0.043
Beryllium	0.011 ^b	<0.002	<0.02
Cadmium	0.00029 ^{d,†}	0.000411 J	<0.001
Chromium	0.074/0.011 ^b	0.00281 J	<0.02
Cobalt	0.019 ^b	0.000450 J	<0.04
Fluoride	2.7 ^b	0.0356 J	<0.2
Lead	0.0036 ^d	0.000140 J	<0.002
Lithium	0.44 ^b	0.766	0.11
Mercury	0.00077 ^c	<0.0002	<0.0005
Molybdenum	0.8 ^b	0.0110	<0.1
Radium 226	NE ^e	Not analyzed	Not analyzed
Radium 228	NE ^e	Not analyzed	Not analyzed
Radium 226+228	NE ^e	Not analyzed	Not analyzed
Selenium	0.005 ^c	<0.01	<0.03
Thallium	0.006 ^b	0.0000670 J	0.0001 J

Notes:

1. Where a Kentucky Water Quality Criteria has not been adopted for a specific constituent, USEPA Region 4 Surface Water Screening Values are listed for comparison.
 - a. TDS = total dissolved solids
 - b. USEPA Region 4 Surface Water Screening Values for freshwater chronic exposure, updated August 2015.
 - c. Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure (401 KAR 10:031)
 - d. Calculated Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure using a water hardness value of 110 mg/L. (401 KAR 10:031)
 - e. NE = not established.
 - f. The Kentucky Water Quality Criteria for cadmium under 401 KAR 10:031 have been proposed for amendment under the 2018 Triennial Review by KDEP.

Green Station CCR Landfill
Assessment of Corrective Measures

J The analytical result is less than the reporting limit but greater than the method detection limit and is an approximate value.
Shaded cells = A result above Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure
Bold Text = A results above USEPA Region 4 Surface Water Screening Values



Photo 1: The NW Seep as observed on April 9, 2019.



Photo 2: Bedrock outcrop located west of the NW Seep as observed on April 9, 2019.

2.2.2 Perimeter Seeps

During the July 2018 investigation of River Seeps, the area inside the Landfill perimeter road was also inspected for seeps. Four areas of seepage were identified (see **Figure 2**): along the west side of the landfill (LS-01), the southwest corner (LS-04), the south end adjacent to the South Pond (LS03), and the east side north of MW-2 vicinity (LS02). LS-01, LS-03, LS-04 are directed to the South Pond. LS-02 is directed to the North Pond.

Samples of a select set of these perimeter seeps were collected in July 2018 and tested for the Appendix III, Appendix IV, and general chemistry parameters. The laboratory analytical results are presented in **Appendix D** and summarized below in **Table 3**. The results indicate that these samples exceed Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure for chloride, arsenic, cadmium, and selenium. These seeps do not directly discharge to surface waters, but have the potential to influence groundwater and non-groundwater releases, so they are being addressed by interim corrective measures to manage those potentials.

Table 3 – July 2018 Perimeter Seep Sampling Results

Parameter	Water Quality/Screening Criteria (mg/L) ¹	Laboratory Analytical Results (mg/L)			
		LS01	LS02	LS03	LS04
Appendix III Constituents					
Boron	7.2 ^b	1.15	2.92	2.49	0.799 J
Calcium	116 ^b	1210	1030	2250	1750
Chloride	600 ^c	2090	1710	4370	2710
Fluoride	2.7 ^b	1.68	1.19	0.269 J	1.53
Sulfate	NE ^e	1580	1500	2080	1490
TDS ¹	NE ^e	8560	7080	12400	10100
Appendix IV Constituents					
Antimony	0.19 ^b	0.00432	0.00218	0.0000610 J	0.00470
Arsenic	0.15 ^c	0.364	0.126	0.00176 J	0.300
Barium	0.22 ^b	0.0666 J	0.0627 J	0.140 J	0.101 J
Beryllium	0.011 ^b	<0.002	<0.002	<0.002	<0.002
Cadmium	0.00029 ^{d,1}	<0.001	0.000464 J	0.000279 J	0.000161 J
Chromium	0.074/0.011 ^b	<0.003	<0.003	<0.003	<0.003
Cobalt	0.019 ^b	0.0000370 J	0.000115 J	0.000321 J	<0.005
Fluoride	2.7 ^b	1.68	1.19	0.269 J	1.53
Lead	0.0036 ^d	0.000239 J	0.000247 J	0.000215 J	0.0000730 J
Lithium	0.44 ^b	3.11	2.85	7.19	4.07
Mercury	0.00077 ^c	0.000372	0.000167 J	<0.0002	0.000539
Molybdenum	0.8 ^b	0.0925	1.78	0.792	0.214
Radium 226	NE ^e	0.656 pCi/L	0.658 pCi/L	1.41 pCi/L	0.897 pCi/L
Radium 228	NE ^e	0.851 pCi/L	0.507 pCi/L	0.136 pCi/L	0.873 pCi/L
Radium 226+228	NE ^e	1.51 pCi/L	1.16 pCi/L	1.54 pCi/L	1.77 pCi/L
Selenium	0.005 ^c	0.00781 J	0.0103	0.00163 J	0.0103
Thallium	0.006 ^b	<0.001	<0.001	<0.001	<0.001

Notes:

1. Where a Kentucky Water Quality Criteria has not been adopted for a specific constituent, USEPA Region 4 Surface Water Screening Values are listed for comparison.
 - a. TDS = total dissolved solids
 - b. USEPA Region 4 Surface Water Screening Values for freshwater chronic exposure, updated August 2015.
 - c. Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure (401 KAR 10:031)
 - d. Calculated Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure using a water hardness value of 110 mg/L. (401 KAR 10:031)
 - e. NE = not established.
 - f. The Kentucky Water Quality Criteria for cadmium under 401 KAR 10:031 have been proposed for amendment under the 2018 Triennial Review by KDEP.
 - J The analytical result is less than the reporting limit but greater than the method detection limit and is an approximate value.

Green Station CCR Landfill
Assessment of Corrective Measures

Shaded cells = A result above Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure

Bold Text = A results above USEPA Region 4 Surface Water Screening Values

Interim corrective measures for the perimeter seeps are being planned in a phased approach. The first step is to provide conveyance of the seepage to either the South Pond or to the North Pond, both of which are routed to the Green Surface Impoundment. Removing them from stormwater channels will prevent mixing with impounded stormwater. The use of the South Pond requires re-lining so that the seepage does not have the potential to infiltrate to groundwater. Partial re-lining of the South Pond is also proposed in the corrective measures planned for groundwater impact, which is the subject of a separate ACM. The re-design of the South Pond involves removal of any sludge and creation of two lined sump areas, one on the east end to collect the South and East perimeter seeps and one on the west end to collect Southwest corner perimeter seeps.

3.0 CORRECTIVE ACTION OBJECTIVE (CAO)

As noted in Section 2, non-groundwater releases have been identified, characterized, and interim corrective measures are being planned and implemented. The site-specific Corrective Action Objective (CAO) for non-groundwater releases is to meet the following objectives under the CCR Rule:

- Protect human health and the environment;
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix III and IV constituents 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 (applicable to material releases only); and
- Comply with standards for management of wastes.

Together, these requirements comprise the site-specific CAO. The interim corrective measures described in Section 2 are expected to meet these objectives. Should any further measures be required, these same objectives will be applied.

3.1 Assessment of Interim Corrective Measure Ability to meet CAO

The Interim Corrective Measure being implemented in 2019 is designed to capture river seepage and divert it to KPDES outfalls, eliminating any potential exposure to public health or the environment. It is anticipated that the Interim Corrective Measure will meet the CAOs by effectively eliminating any future river seepage through source control, and as a result, no supplemental remedies are warranted at this time. Performance monitoring will be performed after the Interim Corrective Measure is constructed to demonstrate source control and evaluate the ability of the measure to meet the CAO. If warranted based on performance monitoring results, additional evaluation of supplemental corrective measures will be performed consistent with 40 CFR 257.98(b).

4.0 TECHNOLOGY IDENTIFICATION

As required under the CCR Rule, source control is a first line of corrective measures. In adherence with the BREC's permit conditions, the Site will continue to operate as a solid waste disposal facility through its life cycle and will be closed in accordance with the requirements of the permit. Source control through landfill closure will include installation of final cover that will prevent infiltration and contribute to groundwater quality restoration. Control of groundwater impacts associated with the Green Landfill is also planned and is described in a separate, concurrent ACM.

The identification of potentially applicable supplemental corrective measures technologies for the subject seeps impacted by CCR at the Green Landfill is presented in **Table 4** below.

Table 4 – Potential Corrective Measures Options Technology Description/Overview

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as stand-alone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because by itself, it will not meet the established CAOs.
Hydraulic Containment	Retained	Hydraulic containment in the form of pumping of vertical or horizontal wells would potentially be used to provide spot control of seepage if the interim corrective measures are unable to fully capture the seepage.
Physical Containment	Retained	Physical containment in the form of a cutoff wall would potentially be used to re-direct or otherwise intercept seepage that was not adequately captured by the interim corrective measures.
Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment is retained as a potential supplement to the interim corrective measures in the event that discharge via the station's KPDES permit is not possible.
In-situ Physical/Chemical Treatment	Retained	In-situ treatment is retained in the form of spot treatment or fixation of seepage areas in the event that the interim corrective measures do not adequately address all seepage areas.
Permeable Reactive Barriers (PRB)	Retained	The use of PRBs is retained in the form of a reactive cell in the event that interim measures result in seepage concentrations that require pre-treatment in-situ prior to discharge.
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.

Potentially Applicable Technology	Status	Description/Overview
Other Source Control Technologies	Retained	Control of source area non-groundwater releases is being implemented as interim corrective measures but is retained in the event that interim measures need to be evaluated for expansion.

If the interim corrective measures currently under way are not adequate to meet the corrective action objectives, then an assessment of additional potential technologies that follows the requirements of 40 CFR 257.96 will be revisited.

40 CFR 257.96(c) requires an ACM (if/when performed) to include an analysis of the effectiveness of potential corrective measures in meeting the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

- (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).

5.0 REFERENCES

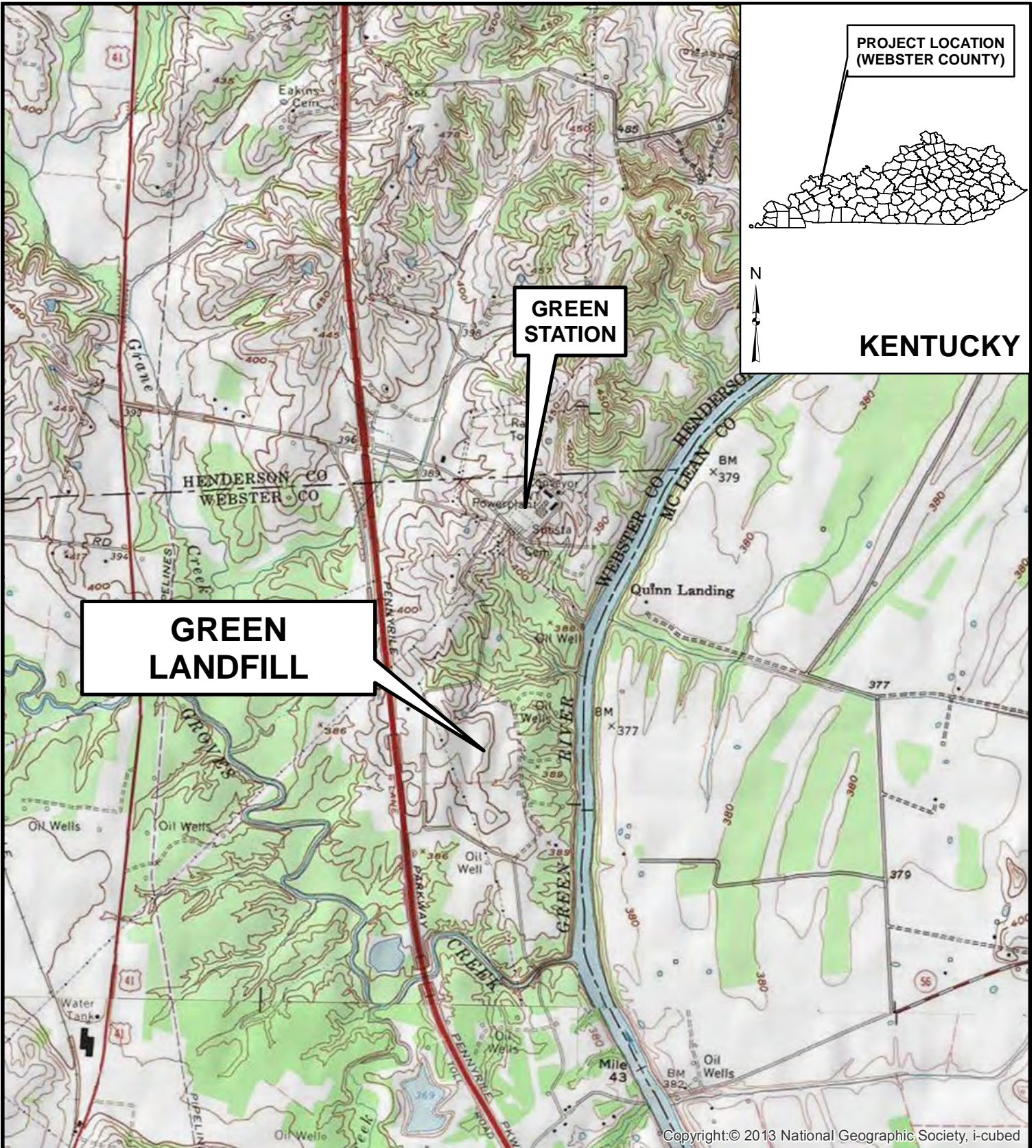
AECOM, 2018. Annual Groundwater Monitoring and Corrective Action Report, 2016-2017; Green Station CCR Landfill, Webster County, Kentucky.

AECOM, 2019. Annual Groundwater Monitoring and Corrective Action Report, 2018; Green Station CCR Landfill, Webster County, Kentucky.

EPA, 40 CFR Part 257. [EPA-HQ-RCRA-2015-0331; FRL-9928-44-OSWER]. RIN-2050-AE81. Technical Amendments to the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities—Correction of the Effective Date. Federal Register / Vol. 80, No. 127 / Thursday, July 2, 2015 / Rules and Regulations.

EPA, 40 CFR Part 257. [EPA-HQ-OLEM-2017-0286; FRL-9973-31-OLEM]. RIN-2050-AG88. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Amendments to the National Minimum Criteria (Phase One); Proposed Rule. Federal Register / Vol. 83, No. 51 / Thursday, March 15, 2018 / Proposed Rules.

Figures

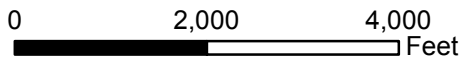


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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ROBARDS QUADRANGLE
DELAWARE QUADRANGLE

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Green Station
Webster County, Kentucky

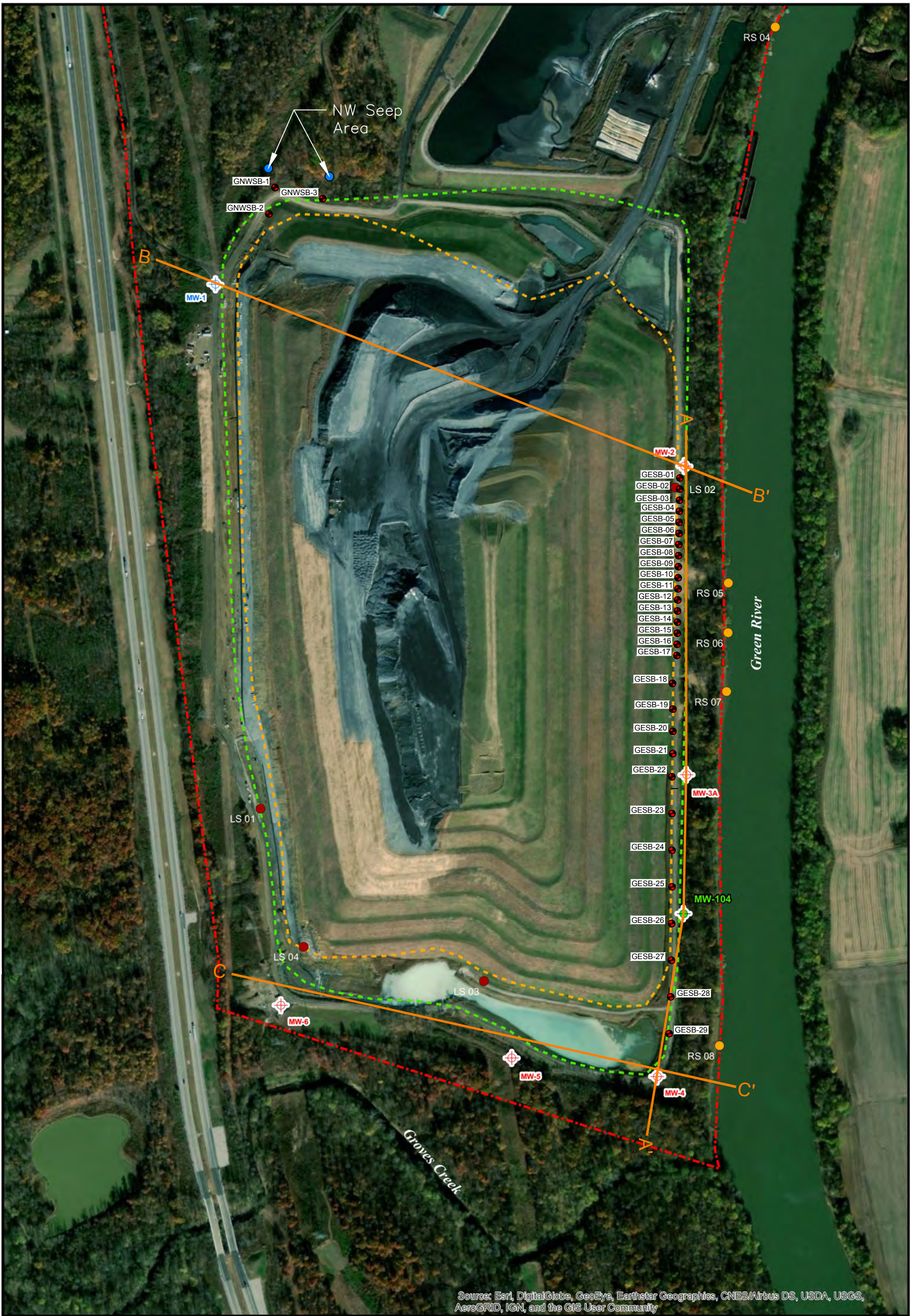
FIGURE 1
SITE LOCATION MAP

DATE: 4/30/2019

SCALE: 1IN = 2,000 FEET

CREATED BY: ALW

JOB NO. 60602364



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend Property Line KAR Permit Area CCR Fill Area Downgradient CCR Monitoring Well Upgradient CCR Monitoring Well Characterization Well		Transect Line Seeps Investigation Borings		Landfill Seep Sample River Seep Sample Seep		N 0 400 800 Feet	Green Station Webster County, Kentucky				
<p align="center">FIGURE 2 Monitoring Well and Seep Location Map</p> <table border="1"> <tr> <td>DATE:06/04/2019</td> <td>SCALE: 1IN = 300 FEET</td> </tr> <tr> <td>CREATED BY: DAS</td> <td></td> </tr> <tr> <td>JOB NO. 60602364</td> <td></td> </tr> </table>							DATE:06/04/2019	SCALE: 1IN = 300 FEET	CREATED BY: DAS		JOB NO. 60602364
DATE:06/04/2019	SCALE: 1IN = 300 FEET										
CREATED BY: DAS											
JOB NO. 60602364											

Appendix A

**Technical Memorandum – River and Seep Sampling and Analysis,
September 6, 2018**

Technical Memorandum

Date: September 6, 2018

To: Mr. Tom Shaw, Ph.D., Big Rivers Electric Corporation
Managing Director Environmental

From: Dennis Connair, Principal Geologist, AECOM

Subject: River and Seep Sampling and Analysis
Green Landfill
Sebree Station
Big Rivers Electric Corporation

Purpose

On behalf of Big Rivers Electric Corporation, AECOM prepared the following technical memorandum to document the activities and results of water sampling conducted along the Green River near the Big Rivers Electric Corporation (BREC) Sebree Station in Webster County, Kentucky. Sampling and analysis was conducted to identify the character of water quality of the river and of water seeping from the river bank in the vicinity of the station's coal combustion residuals (CCR) Green landfill.

ACTIVITIES AND OBSERVATIONS

Water samples were collected on July 12 and July 13, 2018 by AECOM staff Chris Davis and Dennis Connair. Sampling locations were accessed using a johnboat provided by BREC and piloted by BREC staff. Weather conditions at the time of sampling were hot and sunny with little wind. The Green River was near its pool stage at an approximate elevation of 350 feet mean sea level (msl) based on observations on site and data available from the USGS stream gauging station on the Green River at Lock #1 near Spottsville, Kentucky. The river stage had peaked close to 358 feet msl on June 27, 2018 and had steadily declined to July 12, 2018, exposing the river bank and the sampled seepage points.

River Sampling

River samples were collected on July 12, 2018 at four locations identified on Figure 1. Coordinates for each point (Table 1) were measured using a hand-held global positioning system (GPS) unit with sub-meter accuracy.

- Sample R01 was collected near the west bank of the river upstream of Groves Creek. This location was selected as being outside the potential influence of the landfill.
- Sample R02 was collected near the west bank of the river adjacent to seep number RS07, which is elsewhere referred to as the "Area 6" seep.
- Sample R03 was collected near the west bank of the river adjacent to seep number RS05, which is elsewhere referred to as the "Area 8" seep.

- Sample R04 was collected near the west bank of the river adjacent to the downstream end of the landfill footprint (no adjacent seep).

At each of the four locations, river samples were collected three to five feet from the water line at two depths.

- A shallow sample was collected by dipping a laboratory-supplied clean container and filling the requisite (pre-preserved or unpreserved) sample bottles (see photo #1, Attachment 1).
- A deeper sample was collected from within 12 inches of the river bottom using a "Van Dorn" style sampling device (see photo #2, Attachment 1) and decanting the aliquot to the requisite (pre-preserved or unpreserved) sample bottles.

Field measurements of temperature, pH, specific conductance, and oxidation reduction potential (ORP) were collected from the shallow sample locations and recorded in field notes as reported on Table 1. Field data sheets for the river samples are provided as Attachment 2.

All filled sample containers were appropriately labeled and placed in ice-filled coolers and notes regarding sample time, staff, and conditions were recorded. The samples were later repackaged for shipment and the chain-of-custody form completed prior to shipment by overnight service to the analytical laboratory (TestAmerica in Nashville, Tennessee). All samples were tested for the Appendix III and IV parameters under the federal CCR rule in addition to select ionic constituents used for general chemical characterization (alkalinity, magnesium, potassium, and sodium).

Seep Sampling

River bank seeps were identified at sixteen discrete locations in the vicinity of the station as indicated by the "RS" symbols on Figure 1. Coordinates for each point (Table 1) were measured using a hand-held global positioning system (GPS) unit with sub-meter accuracy. Characterization and sampling of the seeps was conducted on July 12 and July 13, 2018. Field data sheets for the river bank seep locations are provided as Attachment 3.

Seeps were recorded at locations on both the east and west banks of the river over two miles upstream of the landfill footprint and over 1.5 miles downstream of the landfill footprint. Some seeps appeared to potentially be associated with a surface water drainage feature, such as RS11 where there appears to be a beaver pond beyond the river bank, but most emanated from otherwise nondescript sections of river bank.

The observed seeps can generally be described as soft, wet areas of river bank sediment between the river water line and three to six feet higher. The seeps occupy between approximately 5 and 150 feet of bank at each location. Some of the seeps had visibly flowing water, but most had a slow enough flow that, if there was free water visible at the surface, the water was not moving. Most of the seeps had some measure of orange-colored iron bacteria growth and some had a green growth. Photographs of the seeps are included as Attachment 1.

The volume of water seeping at each location ranged from imperceptible up to one or two gallons per minute cumulatively. Seep samples were collected using a transfer container (new plastic cup) to fill the laboratory bottles and to collect field measurements of temperature, pH, specific conductance, and ORP. Where sufficient flow was available, the sample was directly dipped from the seep stream. Where flow was insufficient, a shallow trench (1-3 inches deep) in the sediment was excavated to allow water to accumulate so that it could be dipped over a period estimated to be up to 15 minutes.

All filled sample containers were appropriately labeled and placed in ice-filled coolers and notes regarding sample time, staff, and conditions were recorded. The samples were later repackaged for

shipment and the chain-of-custody form completed prior to shipment by overnight service to the analytical laboratory (TestAmerica in Nashville, Tennessee). All samples were tested for the Appendix III and IV parameters under the federal CCR rule in addition to select ionic constituents used for general chemical characterization (alkalinity, magnesium, potassium, and sodium). Laboratory reports are provided as Attachment 4.

FINDINGS

Analytical results for the river and seep sample field and laboratory analyses are summarized on Table 1. The results are organized from upstream to downstream (left to right columns). A chart illustrating the distribution of key Appendix III and Appendix IV concentrations, also organized from upstream to downstream, is presented on Figure 2.

The river samples were all moderately turbid and some of the seep samples were highly turbid due to their collection from the soft sediments, but all laboratory results appear to conform to applicable quality assurance guidelines.

TABLE 1

CCR ANALYTICAL SUMMARY
RIVER SEEP AND RIVER SAMPLE EVALUATION

JULY 2018

BIG RIVERS ELECTRIC CORPORATION
GREEN STATION LANDFILL
WEBSTER COUNTY, KENTUCKY

Field Parameters	PRIMARY MCL and CCR LIMITS	Water Quality Criteria (mg/L)				River Seep-14-71318	River Seep-12-71318	RiverSeep-16-71318	River 01A-71218	River 01B-71218	RiverSeep-08-71318	RiverSeep-07-71218	River 02A-71218	River 02B-71218	RiverSeep-05-71218	River 03A-71218	River 03B-71218	River 04A-71218	River 04B-71218	River-Seep-04-71218
		Human Health		Warm Water Aquatic Habitat		Lat 37.661126 Long -87.4894	Lat 37.61732 Long -87.4936	Lat 37.62167 Long -87.4967	Lat 37.64610 Long -87.5059	Lat 37.64610 Long -87.5059	Lat 37.62860 Long -87.5003	Lat 37.63299 Long -87.5003	Lat 37.63303 Long -87.5002	Lat 37.63303 Long -87.5002	Lat 37.63433 Long -87.5003	Lat 37.63433 Long -87.5002	Lat 37.63433 Long -87.5002	Lat 37.63789 Long -87.5004	Lat 37.63789 Long -87.5004	Lat 37.64122 Long -87.4997
		Domestic Water Supply Source	Fish	Acute	Chronic															
pH (Field Measurement) SU	NA				7.54	7.37	7.46	7.94	7.94	7.09	7.27	7.91	7.91	6.92	7.94	7.94	7.86	7.86	5.13	
pH (Lab Measurement) SU	NA				8.14	8.00	8.40	7.64	7.64	8.16	8.01	7.45	7.50	7.95	7.50	7.51	7.52	7.53	5.26	
Conductivity (µmhos/cm)	NA				1207	226.2	654	268	268	7674	7715	267.7	267.7	6174	262.2	262.2	265.1	265.1	2545	
Temperature (°F)	NA				88.34	84.0	91.58	82.9	82.9	70.52	79.7	84.2	84.2	94.28	84.2	84.2	82.6	82.6	71.6	
Oxidation-Reduction Potential (mV)	NA				-92	-98	-48	131	131	29	-123	98	98	-137	133	133	133	133	125	
APPENDIX III CONSTITUENTS																				
Boron	NA				0.0694 J	0.0379 J	0.0321 J	0.0281 J	0.0252 J	0.510 J	1.46	0.0323 J	0.0322 J	0.853 J	0.0251 J	0.0235 J	0.0229 J	0.0234 J	2.19	
Calcium	NA				171	21.1	93.8	31.8	33.2	801	1120	32.8	35.8	916	34.8	32.6	32.9	34.5	460	
Chloride	NA	250	-	1200	600	22.7	32.7	23.2	4.58 B	4.52 B	2040	1990	6.75 B	6.69 B	1670	5.33 B	5.59 B	4.83 B	189	
Fluoride	4 mg/L	4	-	-	-	0.144 J	0.0803 J	0.177 J	0.111 J	0.105 J	0.0915 J	0.102 J	0.0958 J	0.0979 J	0.0795 J	0.100 J	0.0954 J	0.0948 J	0.239 J F1	
Sulfate	NA	250	-	-	-	159 B	16.1 B	26.5 B	28.5	1440 B	1480 B	30.6	30.1	1170 B	28.8	28.9	28.6	28.6	1310 B	
Total Dissolved Solids	NA	250	-	-	-	790	157	504	169	5310	6080	173	170	5310	170	170	174	156	2130	
APPENDIX IV CONSTITUENTS																				
Antimony	0.006 mg/L	0.0056	0.64	-	-	0.000312 J	0.000499 J	0.000270 J	0.000591 JB	0.000476 JB	0.00141 J	ND	0.00276 B	0.00106 JB	0.000366 J	0.000571 JB	0.000514 JB	0.000504 JB	0.000360 JB	0.000200 J
Arsenic	0.01 mg/L	0.01	-	0.340	0.150	0.0173	0.00467 J	0.0247	0.00124 J	0.00137 J	0.000404 J	0.00182 J	0.00131 J	0.00135 J	0.0192	0.00126 J	0.00131 J	0.00118 J	0.00109 J	0.00188 J
Barium	2 mg/L	1	-	-	-	0.242	0.0757 J	0.190 J	0.0330 J	0.0374 J	0.0443 J	0.0605 J	0.0350 J	0.0396 J	0.718	0.0366 J	0.0362 J	0.0382 J	0.0402 J	0.0384 J
Beryllium	0.004 mg/L	0.004	-	-	-	0.000497 J	0.000145 J	0.000211 J	ND	ND	ND	ND	ND	0.000545 J	ND	ND	ND	ND	0.00372	
Cadmium	0.005 mg/L	0.005	-	0.00235	0.00029	0.000312 J	0.000183 J	0.000196 J	ND	ND	ND	ND	ND	0.000563 J	ND	ND	ND	ND	0.00307	
Chromium	0.1 mg/L	0.1	-	-	-	0.00969	0.00200 J	0.00383	0.000676 J	0.00143 J	0.000560 J	0.000340 J	0.00111 J	0.00155 J	0.0124	0.00112 J	0.00119 J	0.00134 J	0.00105 J	0.00386
Cobalt	0.006 mg/L					0.0125	0.00581	0.00613	0.000401 J	0.000623 J	0.000691 J	0.0218	0.000730 J	0.000937 J	0.0327	0.000934 J	0.000800 J	0.000841 J	0.000738 J	0.0447
Fluoride	4 mg/L	4	-	-	-	0.144 J	0.0803 J	0.177 J	0.111 J	0.105 J	0.0915 J	0.102 J	0.0958 J	0.0979 J	0.0795 J	0.100 J	0.0954 J	0.0948 J	0.0945 J	0.239 J F1
Lead	0.015 mg/L	0.015	-	0.092	0.0036	0.0109	0.00221 J	0.00521	0.000994 JB	0.00600 B	0.000769 J	0.000523 J	0.00125 JB	0.00199 JB	0.0104	0.00115 JB	0.00166 JB	0.00141 JB	0.00147 JB	0.00507
Lithium	0.040 mg/L					0.0126 J	ND	ND	ND	ND	1.80	0.772	ND	ND	0.340	ND	ND	ND	0.0209 J	
Mercury	0.002 mg/L	0.002	0.000051	0.0014	0.00077	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Molybdenum	0.1 mg/L					0.00550 J	0.000948 J	0.00878 J	0.00217 J	0.00130 J	0.00296 J	0.00219 J	0.00222 J	0.00145 J	0.00442 J	0.00105 J	0.00103 J	0.00101 J	0.000981 J	ND
Radium 226						NS	1.17	NS	0.417	0.249	1.31	1.4	0.554	0.735	7.64	0.404 U	0.391 U	0.544	0.423 U	1.48
Radium 228	5 pCi/L	5 pCi/L																		
Selenium	0.05 mg/L	0.17	-	-	0.005	0.000582 J	ND	0.000906 J	ND	ND F2	ND	ND	0.000423 J	0.000636 J	0.00121 J	ND	ND	0.000402 J	ND	0.00216 J
Thallium	0.002 mg/L	0.00024	0.00047	-	-	0.000126 J	ND	ND	0.000500 J	ND	ND	ND	ND	0.000164 J	ND	ND	ND	ND	ND	
IONIC CONSTITUENTS																				
Total Alkalinity	NA					443	38.2	393	85.6	85.6	174	87.7	85.7	85.8	229	86.1	86.4	80.9	85.8	ND
Hardness (as mg/L of CaCO3)**	NA					578	74	318	106	106	3198	3010	108	110	2608	115	108	109	114	1411
Magnesium	NA					36.6	5.20	20.3	6.41	6.62	291	51.8	6.32	6.76	77.8	6.87	6.41	6.45	6.73	63.6
Potassium	NA					4.96	2.37	4.85	2.68	2.91	125	262	3.01	3.65	285	3.06	2.87	2.85	2.95	9.51
Sodium	NA					18.5	5.52	26.7	3.79	3.95	274	277	3.98	4.63	285	4.64	4.01	3.87	4.02	42.1

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
 NA = Not available
 pCi/L = picoCuries per Liter
 SU = Standards units
 µmhos/cm = microSiemens per centimeter
 °F = Degrees Fahrenheit
 mV = millivolts
 ND = Not detected above the Method Detection Limit
 J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
 B = Compound was found in the blank and sample.
 F1 = MS and/or MSD Recovery is outside acceptance limits.
 NM = Not measured
 U = Result is less than the sample detection limit

** The water hardness is using American degree equivalent to mg/L.
 Water hardness(mg/L)=Ca(mg/L)*2.497 + Mg(mg/L)*4.118

Note: River "A" samples collected from surface
 River "B" samples collected <1 foot above river bed

Constituent	KY Acute Warm Water Habitat Equation	Hardness (mg/L CaCO ₃)	Hardness** (mg/L CaCO ₃)
		50	110
		Criterion (µg/L)	Criterion (µg/L)
Cadmium	Criterion = e(1.0166 (ln Hard*)-3.924)	1.05	2.35
Lead	Criterion = e(1.273 (ln Hard*)-1.460)	34	92

Constituent	KY Chronic Warm Water Habitat Equation	Hardness (mg/L CaCO ₃)	Hardness** (mg/L CaCO ₃)
		50	110
		Criterion (µg/L)	Criterion (µg/L)
Cadmium	Criterion = e(0.7409 (ln Hard*)-4.719)	0.16	0.29
Lead	Criterion = e(1.273 (ln Hard*)-4.705)	1.3	3.6

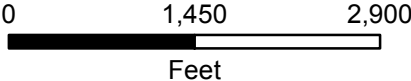
*Hard = Hardness as mg/L CaCO₃ **Average hardness concentration from collected River Samples (7/12/18)




Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Pond Sample
- River Seep Sample
- River Sample
- ⊕ Downgradient Monitoring Well
- ⊕ Upgradient Monitoring Well



		Green Station Landfill Webster County, Kentucky	
FIGURE 1 RIVER AND SEEP SAMPLING LOCATIONS			
DATE: 9/6/2018		SCALE: 1IN = 1800 FEET	
CREATED BY: MRH			
JOB NO. 60579938			

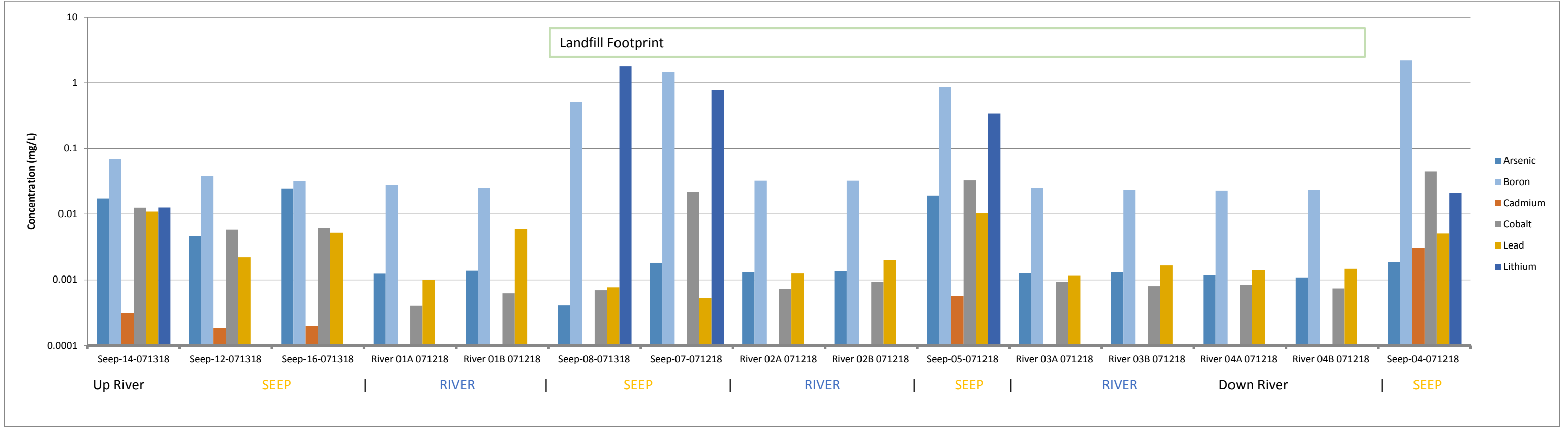
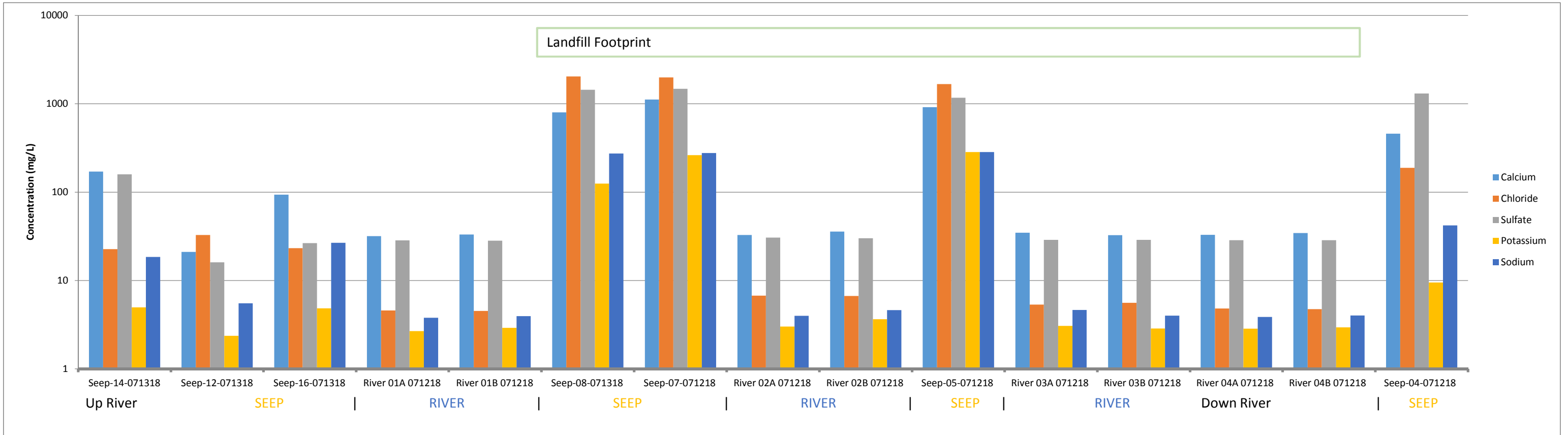


FIGURE 2
 CCR ANALYTICAL SUMMARY - GREEN STATION LANDFILL
 RIVER SEEP AND RIVER SAMPLE EVALUATION, JULY 2018

Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No. 60579938
--	---	--------------------------------

Photo No. 1	Date: 07/12/18	
Direction Photo Taken: West		
Description: R02 location – River surface water sample.		

Photo No. 2	Date: 07/12/18	
Direction Photo Taken: West		
Description: R01 location – “Van Dom” style sampling device		

Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No. 60579938
--	---	--------------------------------

Photo No. 3	Date: 07/12/18	
Direction Photo Taken: Southeast		
Description: RS01 - River Seep 01 No sample collected due to insufficient volume		

Photo No. 4	Date: 07/12/18	
Direction Photo Taken:		
Description: RS02 - River Seep 02 No sample collected due to insufficient volume		

Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No.: 60579938
--	---	---------------------------------

Photo No. 5	Date: 07/12/18	
Direction Photo Taken: Southeast		
Description: RS03 - River Seep 03 No sample collected due to insufficient volume Field parameters collected		

Photo No. 6	Date: 07/12/18	
Direction Photo Taken: West		
Description: RS04 - River Seep 04 Sample collected		


Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No. 60579938
--	---	--------------------------------

Photo No. 7	Date: 07/12/18	
Direction Photo Taken: West		
Description: RS05 – River Seep 05 Sample collected		

Photo No. 8	Date: 07/12/18	
Direction Photo Taken: West		
Description: RS06 – River Seep 06 No sample collected due to insufficient volume		

Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No.: 60579938
--	---	---------------------------------

Photo No.: 9	Date: 07/12/18	
Direction Photo Taken: West		
Description: RS07 – River Seep 07 Sample collected		

Photo No.: 10	Date: 07/13/18	
Direction Photo Taken: North		
Description: RS08 – River Seep 08 Sample collected		

Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No. 60579938
--	---	--------------------------------

Photo No. 11	Date: 07/13/18	
Direction Photo Taken: South		
Description: RS09 - River Seep 09 No sample collected due to insufficient volume		

Photo No. 12	Date: 07/13/18	
Direction Photo Taken: West, Southwest		
Description: RS-10 – River Seep 10 No sample collected due to insufficient volume		

Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No. 60579938
--	---	--------------------------------

Photo No. 13	Date: 07/13/18	
Direction Photo Taken: West, Southwest		
Description: RS11 – River Seep 11 No sample collected due to insufficient volume Field parameters collected		

Photo No. 14	Date: 07/13/18	
Direction Photo Taken: West, Southwest		
Description: RS12 – River Seep 12 Sample collected		

Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No. 60579938
--	---	--------------------------------

Photo No. 15	Date: 07/13/18	
Direction Photo Taken: West, Southwest		
Description: RS13 – River Seep 13 No sample collected due to insufficient volume Field parameters collected		

Photo No. 16	Date: 07/13/18	
Direction Photo Taken: West, Southwest		
Description: RS14 – River Seep 14 Sample collected		

Facility Name: Big Rivers - Sebree Station	Site Sampling Location: Green River, between river marker 41 and 43	Project No. 60579938
--	---	--------------------------------

Photo No. 17	Date: 08/07/18	
Direction Photo Taken: East, Northeast		
Description: RS15 – River Seep 15 No sample collected due to insufficient volume		

Photo No. 18	Date: 07/13/18	
Direction Photo Taken: Northwest		
Description: RS16 - River Seep 16 Sample collected		

Attachment 2

Field Data Sheets – River Sample Locations

Surface
~~SPRING/SEEP~~ WATER DATA SHEET

Job Name: BREC - Green Location: Sebree Ky

Sample Identification: River - 01A, 01B Sampling Order: 1

SAMPLE DATA

Date/Time: 7/12/18 1110

Measured By: CDD, JPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.94

Field Conductivity (μ mhos/cm) 268

Field Temperature ($^{\circ}$ F) 82.9

ORP (mV) 131

Dissolved Oxygen (mg/L) —

Turbidity (NTU) —

Sample Odor None

Sample Color slt cloudy

Sample Sediment Content low to med

Weather Conditions sun 80s

Sampling Splits or Duplicates No

Samples Shipped To TA - Nashville Date Samples were shipped 7/12/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected ApH, IV, Anions

COMMENTS

River - 01A at surface
River - 01B 1 foot above bottom, 2 ft deep

Surface
~~SPRING/SEEP~~ WATER DATA SHEET

Job Name: BREC - Green Location: Sobree, Ky

Sample Identification: River - 02A, 02B Sampling Order: 2

SAMPLE DATA

Date/Time 7/12/18 1150

Measured By: CDD, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.91

Field Conductivity (μ mhos/cm) 267.7

Field Temperature ($^{\circ}$ F) 84.2

ORP (mV) 98

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor none

Sample Color slt brown

Sample Sediment Content low to mod

Weather Conditions 80s sun

Sampling Splits or Duplicates No

Samples Shipped To TA-Nashville Date Samples were shipped 7/12/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV, Anions

COMMENTS

River 02A collected at surface
River 02B 1ft off bottom, 10' from surface

Surface
~~SPRING/SEEP~~ WATER DATA SHEET

Job Name: BAEC-Green Location: Seabee Ky

Sample Identification: River-03A, 03B Sampling Order: 3

SAMPLE DATA

Date/Time: 7/12/18 12:15

Measured By: CDD, DRC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.94

Field Conductivity (μ mhos/cm) 262.2

Field Temperature ($^{\circ}$ F) 84.2

ORP (mV) 133

Dissolved Oxygen (mg/l) -

Turbidity (NTU) -

Sample Odor ~~silt brown~~ none

Sample Color silt brown

Sample Sediment Content low to med

Weather Conditions sun 80s

Sampling Splits or Duplicates No

Samples Shipped To Fedex, TA Nashville Date Samples were shipped 7/12/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV

COMMENTS

River 03A at surface = 5ft from bank
River 03B - 1ft from bottom 4' dip depth

~~Surface~~
SPRING/SEEP WATER DATA SHEET

Job Name: BREC - Green Location: Sobree, Ky

Sample Identification: River - 04A, 04B Sampling Order: 4

SAMPLE DATA

Date/Time: 7/12/18 1240

Measured By: COD, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.86

Field Conductivity (μ mhos/cm) 265.1

Field Temperature ($^{\circ}$ F) 82.6

ORP (mV) 133

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor none

Sample Color slt brown

Sample Sediment Content low to med

Weather Conditions Sun 80s

Sampling Splits or Duplicates NO

Samples Shipped To TA Nashville Date Samples were shipped 7/12/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV, Anions

COMMENTS

River 04A - collected at surface
River 04B - 2ft below surface, 1ft above bottom

Attachment 3

Field Data Sheets – River Bank Seep Locations

SPRING/SEEP WATER DATA SHEET

Job Name: BREC Green Location: Sobies, Ky
Sample Identification: River Seep - 01 Sampling Order: 5

SAMPLE DATA

Date/Time: 7/12/18 1311
Measured By: COU, JRC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) No parameters due to insufficient volume

Field Conductivity (µmhos/cm) _____

Field Temperature (°F) _____

ORP (mV) _____

Dissolved Oxygen (mg/L) _____

Turbidity (NTU) _____

Sample Odor NA

Sample Color NA

Sample Sediment Content NA

Weather Conditions Sun 80s

Sampling Splits or Duplicates NO

Samples Shipped To NA Date Samples were shipped NA

Method of Shipment NA Hand Delivered _____ Other _____

Parameters Collected None

COMMENTS

East bank, orange staining

SPRING/SEEP WATER DATA SHEET

Job Name: BRIC - Green Location: Sabree, Ky
Sample Identification: River Seep - 02 Sampling Order: 6

SAMPLE DATA

Date/Time: 7/12/19 1317
Measured By: CDD, DRC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) insufficient volume

Field Conductivity (μ mhos/cm) _____

Field Temperature ($^{\circ}$ F) _____

ORP (mV) _____

Dissolved Oxygen (mg/L) _____

Turbidity (NTU) _____

Sample Odor _____

Sample Color _____

Sample Sediment Content _____

Weather Conditions _____

Sampling Splits or Duplicates _____

Samples Shipped To NA Date Samples were shipped _____

Method of Shipment _____ Hand Delivered _____ Other _____

Parameters Collected None

COMMENTS

East bank, low flow & staining

SPRING/SEEP WATER DATA SHEET

Job Name: BREC-Green Location: Seb100, Ky
Sample Identification: River Seep 03 Sampling Order: 7

SAMPLE DATA

Date/Time: 7/12/18 1331
Measured By: CDD, DRC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.14

Field Conductivity (μ mhos/cm) 804.35

Field Temperature ($^{\circ}$ F) 77.18

ORP (mV) -73

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor -

Sample Color -

Sample Sediment Content -

Weather Conditions Sun 80s

Sampling Splits or Duplicates -

Samples Shipped To - Date Samples were shipped -

Method of Shipment - Hand Delivered Other

Parameters Collected None

COMMENTS

insufficient flow to sample, East bank, orange staining

SPRING/SEEP WATER DATA SHEET

Job Name: BREC-Green Location: Sabree Ky
Sample Identification: River Seep 04 Sampling Order: 8

SAMPLE DATA

Date/Time: 7/12/18 1350
Measured By: CDD, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 5.13

Field Conductivity (μ mhos/cm) 2545

Field Temperature ($^{\circ}$ F) 71.6

ORP (mV) 125

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor none

Sample Color clear w orange staining

Sample Sediment Content low

Weather Conditions sun ☁s

Sampling Splits or Duplicates NO

Samples Shipped To TA Nashville Date Samples were shipped 7/13/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV, Anions

COMMENTS

West bank near pond 011, 1-2 GPM cumulative

SPRING/SEEP WATER DATA SHEET

Job Name: BAEC - Green Location: Sobroo, ky
Sample Identification: River Seep-05 Sampling Order: 7

SAMPLE DATA

Date/Time: 7/12/18 1425
Measured By: CWD, DIC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 6.92

Field Conductivity (µmhos/cm) 6174

Field Temperature (°F) 44.28

ORP (mV) -137

Dissolved Oxygen (mg/l) -

Turbidity (NTU) -

Sample Odor none

Sample Color brown

Sample Sediment Content high

Weather Conditions sm 80s

Sampling Splits or Duplicates no

Samples Shipped To TA Nashville Date Samples were shipped 7/13/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV, Amions

COMMENTS

Flow 51gpm, near the "Acra 8"

SPRING/SEEP WATER DATA SHEET

Job Name: BREC - Groen Location: Sabree, Ky
Sample Identification: River Seep - 06 Sampling Order: 10

SAMPLE DATA

Date/Time: 7/12/18 1439
Measured By: CSO, JRC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) NM - insufficient flow
Field Conductivity (μ mhos/cm) _____
Field Temperature ($^{\circ}$ F) _____
ORP (mV) _____
Dissolved Oxygen (mg/l) _____
Turbidity (NTU) _____
Sample Odor _____
Sample Color _____
Sample Sediment Content _____
Weather Conditions sm 80s
Sampling Splits or Duplicates NA
Samples Shipped to NA Date Samples were shipped NA
Method of Shipment NA Hand Delivered _____ Other _____
Parameters Collected none collected

COMMENTS

Ground sheet flow \approx 30 ft wide, insufficient flow

SPRING/SEEP WATER DATA SHEET

Job Name: BREC - Green Location: Sabree, Ky
Sample Identification: River Seep-07 Sampling Order: 11

SAMPLE DATA

Date/Time: 7/12/18 1450
Measured By: CO, JPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.27

Field Conductivity (μ mhos/cm) 7715

Field Temperature ($^{\circ}$ F) 79.7

ORP (mV) -123

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor clear to slt cloudy

Sample Color none

Sample Sediment Content low to mod

Weather Conditions sun 80s

Sampling Splits or Duplicates NO

Samples Shipped To TA - Nashville Date Samples were shipped 7/13/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV, Anions

COMMENTS

Flow 1-2 gpm spread over 100', high on bank area

SPRING/SEEP WATER DATA SHEET

Job Name: BREC - Green Location: Sebrae

Sample Identification: River Seep 08 Sampling Order: 1A

SAMPLE DATA

Date/Time: 7/13/18 0750

Measured By: CDP, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.09 7.08

Field Conductivity (μ mhos/cm) 7674 7800

Field Temperature ($^{\circ}$ F) 70.52 65.3

ORP (mV) 29 53

Dissolved Oxygen (mg/l) - -

Turbidity (NTU) - -

Sample Odor clear now

Sample Color clear

Sample Sediment Content low

Weather Conditions sun 60s

Sampling Splits or Duplicates NO

Samples Shipped To TA Nashville Date Samples were shipped 7/13/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV, Anions

COMMENTS

near old pond area, top of ss bedrock flow
flow < 1gm at sample point,

SPRING/SEEP WATER DATA SHEET

Job Name: BREC - Green Location: Sabree, Ky
Sample Identification: River Seep 09 Sampling Order: 13

SAMPLE DATA

Date/Time: 7/13/18 0835
Measured By: CDD, DPL

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) Insufficient volume for parameters
Field Conductivity (μ mhos/cm) _____
Field Temperature ($^{\circ}$ F) _____
ORP (mV) _____
Dissolved Oxygen (mg/L) _____
Turbidity (NTU) _____
Sample Odor _____
Sample Color _____

Sample Sediment Content _____
Weather Conditions sun 40s
Sampling Splits or Duplicates NA
Samples Shipped To NA Date Samples were shipped NA
Method of Shipment NA Hand Delivered _____ Other _____
Parameters Collected None

COMMENTS

Minor seepage, orange staining, no vis flow

SPRING/SEEP WATER DATA SHEET

Job Name: BREC-Groen Location: Sebrae, Ky
Sample Identification: River Seep 10 Sampling Order: 14

SAMPLE DATA

Date/Time: 7/13/16 0852
Measured By: COJ, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) Insufficient Volume

Field Conductivity (μ mhos/cm) _____

Field Temperature ($^{\circ}$ F) _____

ORP (mV) _____

Dissolved Oxygen (mg/L) _____

Turbidity (NTU) _____

Sample Odor _____

Sample Color _____

Sample Sediment Content _____

Weather Conditions sun 80s

Sampling Splits or Duplicates N

Samples Shipped To NA Date Samples were shipped NA

Method of Shipment NA Hand Delivered _____ Other _____

Parameters Collected NA

COMMENTS

minor seepage w orange staining

SPRING/SEEP WATER DATA SHEET

Job Name: BREL-green Location: Sobree, Ky
Sample Identification: River Seep II Sampling Order: 15

SAMPLE DATA

Date/Time: 7/13/18 0857
Measured By: CDD, DPC

Calibration of pH meter in field 4pH 7pH 10pH not done

Field pH (units) 7.35

Field Conductivity (μ mhos/cm) 364

Field Temperature ($^{\circ}$ F) NM

ORP (mV) -85

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor -

Sample Color -

Sample Sediment Content -

Weather Conditions 5m 80%

Sampling Splits or Duplicates N

Samples Shipped To NA Date Samples were shipped NA

Method of Shipment NA Hand Delivered Other

Parameters Collected None

COMMENTS

Pond area above, flow from high on bank
Not Sampled

SPRING/SEEP WATER DATA SHEET

Job Name: BREC-Green Location: Seblee, Ky
Sample Identification: River Seep 12 Sampling Order: 16

SAMPLE DATA

Date/Time: 7/13/18 0915
Measured By: CDD, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.37

Field Conductivity (μ mhos/cm) 226.2

Field Temperature ($^{\circ}$ F) 84.0

ORP (mV) -98

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor ~~cloudy~~ none

Sample Color cloudy to slt brown

Sample Sediment Content low to med

Weather Conditions sun 80s

Sampling Splits or Duplicates NO

Samples Shipped To TA - Nashville Date Samples were shipped 7/13/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV, Anions

COMMENTS

< 1/4 gpm flow

SPRING/SEEP WATER DATA SHEET

Job Name: BREC - Green Location: Sebree, Ky
Sample Identification: River Seep 13 Sampling Order: 17

SAMPLE DATA

Date/Time: 7/13/18 0630
Measured By: CAD, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) ~~Insufficient Flow~~ ^{CD} 7.0
Field Conductivity (μ mhos/cm) 701.9
Field Temperature ($^{\circ}$ F) 84.0
ORP (mV) -152
Dissolved Oxygen (mg/L) -
Turbidity (NTU) -
Sample Odor -
Sample Color -
Sample Sediment Content -
Weather Conditions Sun 80s
Sampling Splits or Duplicates N
Samples Shipped To NA Date Samples were shipped NA
Method of Shipment NA Hand Delivered Other
Parameters Collected Nine

COMMENTS

Insufficient flow to sample

SPRING/SEEP WATER DATA SHEET

Job Name: BREC-Green Location: Sebley, Ky

Sample Identification: River Seep 14 Sampling Order: 18

SAMPLE DATA

Date/Time: 7/13/18 1010

Measured By: CDD, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.54

Field Conductivity (µmhos/cm) 1207

Field Temperature (°F) 88.34

ORP (mV) -92

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor -

Sample Color clear

Sample Sediment Content low

Weather Conditions sun 80s

Sampling Splits or Duplicates ~

Samples Shipped To TA Nashville Date Samples were shipped 7/13/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App III, IV, Anions - No Radium

COMMENTS

orange staining, pooled on soft bank ledge
collected from pool dug w tool

SPRING/SEEP WATER DATA SHEET

Job Name: BREC-Green Location: Seblee, Ky
Sample Identification: River Seep 15 Sampling Order: 19

SAMPLE DATA

Date/Time: 7/13/16 1033
Measured By: CDD, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) Insufficient Volume

Field Conductivity (μ mhos/cm) _____

Field Temperature ($^{\circ}$ F) _____

ORP (mV) _____

Dissolved Oxygen (mg/L) _____

Turbidity (NTU) _____

Sample Odor _____

Sample Color _____

Sample Sediment Content _____

Weather Conditions sun 80s

Sampling Splits or Duplicates NA

Samples Shipped To _____ Date Samples were shipped MT

Method of Shipment _____ Hand Delivered _____ Other _____

Parameters Collected No Sample

COMMENTS

East Bank upstream, some orange staining / no flow

SPRING/SEEP WATER DATA SHEET

Job Name: BREC - Green Location: Sebree, Ky

Sample Identification: River Seep 16 Sampling Order: 20

SAMPLE DATA Date/Time: 7/13/18
Measured By: CWD, DPC

Calibration of pH meter in Field 4pH 7pH 10pH not done

Field pH (units) 7.46

Field Conductivity (μ mhos/cm) 654

Field Temperature ($^{\circ}$ F) 91.58

ORP (mV) -48

Dissolved Oxygen (mg/L) -

Turbidity (NTU) -

Sample Odor -

Sample Color -

Sample Sediment Content stone to moderate

Weather Conditions sun 60s

Sampling Splits or Duplicates ND

Samples Shipped To TA Nashville Date Samples were shipped 7/13/18

Method of Shipment Fedex Hand Delivered Other

Parameters Collected App II, IV, Anions No Radium

COMMENTS
Adj to best ramp, very low flow 0.17 gpm, collected from trench dug w tool

Attachment 4

LABORATORY REPORTS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-155625-1
Client Project/Site: Green Landfill

For:
Big Rivers Electric Corporation
PO BOX 24
Henderson, Kentucky 42419

Attn: Greg Dick

Roxanne Cisneros

Authorized for release by:
8/16/2018 3:18:48 PM

Roxanne Cisneros, Senior Project Manager
(615)301-5761
roxanne.cisneros@testamericainc.com

LINKS

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www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



Table of Contents

Cover Page	1
Table of Contents	2
Sample Summary	3
Case Narrative	4
Definitions	5
Client Sample Results	6
QC Sample Results	22
QC Association	30
Chronicle	34
Method Summary	38
Certification Summary	39
Chain of Custody	41
Receipt Checklists	45
Tracer Carrier Summary	46

Sample Summary

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-155625-1	River 01A 071218	Water	07/12/18 11:10	07/13/18 10:10
490-155625-2	River 01B 071218	Water	07/12/18 11:30	07/13/18 10:10
490-155625-3	River 02A 071218	Water	07/12/18 11:50	07/13/18 10:10
490-155625-4	River 02B 071218	Water	07/12/18 12:00	07/13/18 10:10
490-155625-5	River 03A 071218	Water	07/12/18 12:15	07/13/18 10:10
490-155625-6	River 03B 071218	Water	07/12/18 12:20	07/13/18 10:10
490-155625-7	River 04A 071218	Water	07/12/18 12:45	07/13/18 10:10
490-155625-8	River 04B 071218	Water	07/12/18 12:55	07/13/18 10:10



Case Narrative

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Job ID: 490-155625-1

Laboratory: TestAmerica Nashville

Narrative

**Job Narrative
490-155625-1**

Comments

Revised Report 8/07/2018 to add Potassium and Total Alkalinity per request.

Receipt

The samples were received on 7/13/2018 10:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.5° C and 1.3° C.

HPLC/IC

Method(s) 9056A: The method blank for analytical batch 490-529755 contained Chloride above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

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

Metals

Method(s) 6020A: The matrix spike / matrix spike duplicate / sample duplicate (MS/MSD/DUP) precision for 250895 was outside control limits for selenium. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision was within acceptance limits.

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

General Chemistry

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

Organic Prep

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

Narrative

**Job Narrative
490-155625-2**

Comments

No additional comments.

Receipt

The samples were received on 7/13/2018 10:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.5° C and 1.3° C.

RAD

Method(s) PrecSep_0: Radium 228 Prep Batch 160-376424: Sample aliquots reduced due to potential matrix interference. Samples were yellow, murky, and contained heavy amounts of sediment: River 01A 071218 (490-155625-1), River 01B 071218 (490-155625-2), River 02A 071218 (490-155625-3), River 02B 071218 (490-155625-4), River 03A 071218 (490-155625-5), River 03B 071218 (490-155625-6), River 04A 071218 (490-155625-7) and River 04B 071218 (490-155625-8)

Method(s) PrecSep-21: Radium 226 Prep Batch 160-376411: Sample aliquots reduced due to potential matrix interference. Samples were yellow, murky, and contained heavy amounts of sediment: River 01A 071218 (490-155625-1), River 01B 071218 (490-155625-2), River 02A 071218 (490-155625-3), River 02B 071218 (490-155625-4), River 03A 071218 (490-155625-5), River 03B 071218 (490-155625-6), River 04A 071218 (490-155625-7) and River 04B 071218 (490-155625-8)

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

Definitions/Glossary

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F2	MS/MSD RPD exceeds control limits

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

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

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 01A 071218

Lab Sample ID: 490-155625-1

Date Collected: 07/12/18 11:10

Matrix: Water

Date Received: 07/13/18 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.58	B	3.00	0.200	mg/L			07/19/18 02:20	1
Fluoride	0.111	J	1.00	0.0100	mg/L			07/19/18 02:20	1
Sulfate	28.5		5.00	0.0300	mg/L			07/19/18 02:20	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 14:09	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000591	J B	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 20:31	1
Arsenic	0.00124	J	0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 20:31	1
Barium	0.0330	J	0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 20:31	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 20:31	1
Boron	0.0281	J	1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 20:31	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 20:31	1
Calcium	31.8		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 20:31	1
Chromium	0.000676	J	0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 20:31	1
Cobalt	0.000401	J	0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 20:31	1
Lead	0.000994	J B	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 20:31	1
Magnesium	6.41		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 20:31	1
Molybdenum	0.00217	J	0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 20:31	1
Potassium	2.68		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 20:31	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 20:31	1
Sodium	3.79		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 20:31	1
Thallium	0.0000500	J	0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 20:31	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 10:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.64		0.100	0.100	SU			07/18/18 10:03	1
Temperature	19.1		0.100	0.100	Degrees C			07/18/18 10:03	1
Alkalinity	85.6		10.0	5.00	mg/L			07/24/18 12:48	1
Total Dissolved Solids	169		10.0	7.00	mg/L			07/13/18 21:20	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.392		0.137	0.142	1.00	0.119	pCi/L	07/18/18 09:53	08/09/18 06:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.9		40 - 110					07/18/18 09:53	08/09/18 06:09	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 01A 071218

Lab Sample ID: 490-155625-1

Date Collected: 07/12/18 11:10

Matrix: Water

Date Received: 07/13/18 10:10

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0258	U	0.229	0.229	1.00	0.411	pCi/L	07/18/18 10:47	08/01/18 16:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.9		40 - 110					07/18/18 10:47	08/01/18 16:50	1
Y Carrier	90.1		40 - 110					07/18/18 10:47	08/01/18 16:50	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.417		0.267	0.269	5.00	0.411	pCi/L		08/16/18 13:40	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 01B 071218

Lab Sample ID: 490-155625-2

Date Collected: 07/12/18 11:30

Matrix: Water

Date Received: 07/13/18 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.52	B	3.00	0.200	mg/L			07/19/18 03:15	1
Fluoride	0.105	J	1.00	0.0100	mg/L			07/19/18 03:15	1
Sulfate	28.3		5.00	0.0300	mg/L			07/19/18 03:15	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 14:30	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000476	J B	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 20:35	1
Arsenic	0.00137	J	0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 20:35	1
Barium	0.0374	J	0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 20:35	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 20:35	1
Boron	0.0252	J	1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 20:35	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 20:35	1
Calcium	33.2		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 20:35	1
Chromium	0.00143	J	0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 20:35	1
Cobalt	0.000623	J	0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 20:35	1
Lead	0.00600	B	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 20:35	1
Magnesium	6.62		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 20:35	1
Molybdenum	0.00130	J	0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 20:35	1
Potassium	2.91		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 20:35	1
Selenium	ND	F2	0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 20:35	1
Sodium	3.95		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 20:35	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 20:35	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 10:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.62		0.100	0.100	SU			07/18/18 10:03	1
Temperature	19.1		0.100	0.100	Degrees C			07/18/18 10:03	1
Alkalinity	85.6		10.0	5.00	mg/L			07/24/18 12:55	1
Total Dissolved Solids	161		10.0	7.00	mg/L			07/13/18 21:20	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.249		0.112	0.114	1.00	0.115	pCi/L	07/18/18 09:53	08/09/18 06:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110					07/18/18 09:53	08/09/18 06:10	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 01B 071218

Lab Sample ID: 490-155625-2

Date Collected: 07/12/18 11:30

Matrix: Water

Date Received: 07/13/18 10:10

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.00993	U	0.274	0.274	1.00	0.489	pCi/L	07/18/18 10:47	08/01/18 16:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110					07/18/18 10:47	08/01/18 16:50	1
Y Carrier	90.1		40 - 110					07/18/18 10:47	08/01/18 16:50	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.249	U	0.296	0.297	5.00	0.489	pCi/L		08/16/18 13:40	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 02A 071218

Lab Sample ID: 490-155625-3

Date Collected: 07/12/18 11:50

Matrix: Water

Date Received: 07/13/18 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.75	B	3.00	0.200	mg/L			07/19/18 03:33	1
Fluoride	0.0958	J	1.00	0.0100	mg/L			07/19/18 03:33	1
Sulfate	30.6		5.00	0.0300	mg/L			07/19/18 03:33	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 14:35	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00276	B	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 20:58	1
Arsenic	0.00131	J	0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 20:58	1
Barium	0.0350	J	0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 20:58	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 20:58	1
Boron	0.0323	J	1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 20:58	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 20:58	1
Calcium	32.8		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 20:58	1
Chromium	0.00111	J	0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 20:58	1
Cobalt	0.000730	J	0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 20:58	1
Lead	0.00125	J B	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 20:58	1
Magnesium	6.32		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 20:58	1
Molybdenum	0.00222	J	0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 20:58	1
Potassium	3.01		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 20:58	1
Selenium	0.000423	J	0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 20:58	1
Sodium	3.98		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 20:58	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 20:58	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 10:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.45		0.100	0.100	SU			07/18/18 10:21	1
Temperature	19.8		0.100	0.100	Degrees C			07/18/18 10:21	1
Alkalinity	85.7		10.0	5.00	mg/L			07/24/18 13:02	1
Total Dissolved Solids	173		10.0	7.00	mg/L			07/13/18 21:20	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.336		0.133	0.136	1.00	0.128	pCi/L	07/18/18 09:53	08/09/18 06:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					07/18/18 09:53	08/09/18 06:10	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 02A 071218

Lab Sample ID: 490-155625-3

Date Collected: 07/12/18 11:50

Matrix: Water

Date Received: 07/13/18 10:10

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.218	U	0.288	0.289	1.00	0.480	pCi/L	07/18/18 10:47	08/01/18 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					07/18/18 10:47	08/01/18 16:51	1
Y Carrier	90.1		40 - 110					07/18/18 10:47	08/01/18 16:51	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.554		0.317	0.319	5.00	0.480	pCi/L		08/16/18 13:40	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 02B 071218

Lab Sample ID: 490-155625-4

Date Collected: 07/12/18 12:00

Matrix: Water

Date Received: 07/13/18 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.69	B	3.00	0.200	mg/L			07/19/18 03:51	1
Fluoride	0.0979	J	1.00	0.0100	mg/L			07/19/18 03:51	1
Sulfate	30.1		5.00	0.0300	mg/L			07/19/18 03:51	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 14:41	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00106	J B	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 21:03	1
Arsenic	0.00135	J	0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 21:03	1
Barium	0.0396	J	0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 21:03	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 21:03	1
Boron	0.0322	J	1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 21:03	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 21:03	1
Calcium	35.8		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 21:03	1
Chromium	0.00155	J	0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 21:03	1
Cobalt	0.000937	J	0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 21:03	1
Lead	0.00199	J B	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 21:03	1
Magnesium	6.76		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 21:03	1
Molybdenum	0.00145	J	0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 21:03	1
Potassium	3.65		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 21:03	1
Selenium	0.000636	J	0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 21:03	1
Sodium	4.63		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 21:03	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 21:03	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 10:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.50		0.100	0.100	SU			07/18/18 10:21	1
Temperature	19.5		0.100	0.100	Degrees C			07/18/18 10:21	1
Alkalinity	85.8		10.0	5.00	mg/L			07/24/18 13:09	1
Total Dissolved Solids	170		10.0	7.00	mg/L			07/13/18 21:20	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.318		0.123	0.126	1.00	0.115	pCi/L	07/18/18 09:53	08/09/18 06:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110					07/18/18 09:53	08/09/18 06:11	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 02B 071218

Lab Sample ID: 490-155625-4

Date Collected: 07/12/18 12:00

Matrix: Water

Date Received: 07/13/18 10:10

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.417		0.268	0.271	1.00	0.409	pCi/L	07/18/18 10:47	08/01/18 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110					07/18/18 10:47	08/01/18 16:51	1
Y Carrier	90.1		40 - 110					07/18/18 10:47	08/01/18 16:51	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.735		0.295	0.299	5.00	0.409	pCi/L		08/16/18 13:40	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 03A 071218

Lab Sample ID: 490-155625-5

Date Collected: 07/12/18 12:15

Matrix: Water

Date Received: 07/13/18 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.33	B	3.00	0.200	mg/L			07/19/18 04:09	1
Fluoride	0.100	J	1.00	0.0100	mg/L			07/19/18 04:09	1
Sulfate	28.8		5.00	0.0300	mg/L			07/19/18 04:09	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 14:56	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000571	J B	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 21:21	1
Arsenic	0.00126	J	0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 21:21	1
Barium	0.0366	J	0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 21:21	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 21:21	1
Boron	0.0251	J	1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 21:21	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 21:21	1
Calcium	34.8		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 21:21	1
Chromium	0.00112	J	0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 21:21	1
Cobalt	0.000934	J	0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 21:21	1
Lead	0.00115	J B	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 21:21	1
Magnesium	6.87		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 21:21	1
Molybdenum	0.00105	J	0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 21:21	1
Potassium	3.06		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 21:21	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 21:21	1
Sodium	4.64		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 21:21	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 21:21	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 10:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.50		0.100	0.100	SU			07/18/18 10:21	1
Temperature	19.3		0.100	0.100	Degrees C			07/18/18 10:21	1
Alkalinity	86.1		10.0	5.00	mg/L			07/24/18 13:16	1
Total Dissolved Solids	175		10.0	7.00	mg/L			07/13/18 23:45	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.338		0.126	0.130	1.00	0.110	pCi/L	07/18/18 09:53	08/09/18 06:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.4		40 - 110					07/18/18 09:53	08/09/18 06:11	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 03A 071218

Lab Sample ID: 490-155625-5

Date Collected: 07/12/18 12:15

Matrix: Water

Date Received: 07/13/18 10:10

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0661	U	0.244	0.245	1.00	0.429	pCi/L	07/18/18 10:47	08/01/18 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.4		40 - 110					07/18/18 10:47	08/01/18 16:51	1
Y Carrier	90.8		40 - 110					07/18/18 10:47	08/01/18 16:51	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.404	U	0.275	0.277	5.00	0.429	pCi/L		08/16/18 13:40	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 03B 071218

Lab Sample ID: 490-155625-6

Date Collected: 07/12/18 12:20

Matrix: Water

Date Received: 07/13/18 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.59	B	3.00	0.200	mg/L			07/19/18 04:27	1
Fluoride	0.0954	J	1.00	0.0100	mg/L			07/19/18 04:27	1
Sulfate	28.9		5.00	0.0300	mg/L			07/19/18 04:27	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 15:02	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000514	J B	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 21:25	1
Arsenic	0.00131	J	0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 21:25	1
Barium	0.0362	J	0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 21:25	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 21:25	1
Boron	0.0235	J	1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 21:25	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 21:25	1
Calcium	32.6		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 21:25	1
Chromium	0.00119	J	0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 21:25	1
Cobalt	0.000800	J	0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 21:25	1
Lead	0.00166	J B	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 21:25	1
Magnesium	6.41		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 21:25	1
Molybdenum	0.00103	J	0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 21:25	1
Potassium	2.87		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 21:25	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 21:25	1
Sodium	4.01		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 21:25	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 21:25	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 10:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.51		0.100	0.100	SU			07/18/18 10:21	1
Temperature	19.4		0.100	0.100	Degrees C			07/18/18 10:21	1
Alkalinity	86.4		10.0	5.00	mg/L			07/24/18 13:29	1
Total Dissolved Solids	170		10.0	7.00	mg/L			07/13/18 23:45	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.391		0.146	0.150	1.00	0.123	pCi/L	07/18/18 09:53	08/09/18 06:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110					07/18/18 09:53	08/09/18 06:11	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 03B 071218

Lab Sample ID: 490-155625-6

Date Collected: 07/12/18 12:20

Matrix: Water

Date Received: 07/13/18 10:10

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.197	U	0.229	0.230	1.00	0.449	pCi/L	07/18/18 10:47	08/01/18 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110					07/18/18 10:47	08/01/18 16:51	1
Y Carrier	90.8		40 - 110					07/18/18 10:47	08/01/18 16:51	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.391	U	0.272	0.275	5.00	0.449	pCi/L		08/16/18 13:40	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 04A 071218

Lab Sample ID: 490-155625-7

Date Collected: 07/12/18 12:45

Matrix: Water

Date Received: 07/13/18 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.83	B	3.00	0.200	mg/L			07/19/18 04:45	1
Fluoride	0.0948	J	1.00	0.0100	mg/L			07/19/18 04:45	1
Sulfate	28.6		5.00	0.0300	mg/L			07/19/18 04:45	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 15:07	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000504	J B	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 21:30	1
Arsenic	0.00118	J	0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 21:30	1
Barium	0.0382	J	0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 21:30	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 21:30	1
Boron	0.0229	J	1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 21:30	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 21:30	1
Calcium	32.9		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 21:30	1
Chromium	0.00134	J	0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 21:30	1
Cobalt	0.000841	J	0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 21:30	1
Lead	0.00141	J B	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 21:30	1
Magnesium	6.45		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 21:30	1
Molybdenum	0.00101	J	0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 21:30	1
Potassium	2.85		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 21:30	1
Selenium	0.000402	J	0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 21:30	1
Sodium	3.87		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 21:30	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 21:30	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 10:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.52		0.100	0.100	SU			07/18/18 10:21	1
Temperature	19.4		0.100	0.100	Degrees C			07/18/18 10:21	1
Alkalinity	80.9		10.0	5.00	mg/L			07/24/18 13:36	1
Total Dissolved Solids	174		10.0	7.00	mg/L			07/13/18 23:45	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.309		0.117	0.120	1.00	0.0978	pCi/L	07/18/18 09:53	08/09/18 06:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					07/18/18 09:53	08/09/18 06:11	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 04A 071218

Lab Sample ID: 490-155625-7

Date Collected: 07/12/18 12:45

Matrix: Water

Date Received: 07/13/18 10:10

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.236	U	0.276	0.277	1.00	0.456	pCi/L	07/18/18 10:47	08/01/18 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					07/18/18 10:47	08/01/18 16:51	1
Y Carrier	86.7		40 - 110					07/18/18 10:47	08/01/18 16:51	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.544		0.300	0.302	5.00	0.456	pCi/L		08/16/18 13:40	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 04B 071218

Lab Sample ID: 490-155625-8

Date Collected: 07/12/18 12:55

Matrix: Water

Date Received: 07/13/18 10:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.75	B	3.00	0.200	mg/L			07/19/18 05:03	1
Fluoride	0.0945	J	1.00	0.0100	mg/L			07/19/18 05:03	1
Sulfate	28.6		5.00	0.0300	mg/L			07/19/18 05:03	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 15:12	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000360	J B	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 21:35	1
Arsenic	0.00109	J	0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 21:35	1
Barium	0.0402	J	0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 21:35	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 21:35	1
Boron	0.0234	J	1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 21:35	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 21:35	1
Calcium	34.5		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 21:35	1
Chromium	0.00105	J	0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 21:35	1
Cobalt	0.000738	J	0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 21:35	1
Lead	0.00147	J B	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 21:35	1
Magnesium	6.73		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 21:35	1
Molybdenum	0.000981	J	0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 21:35	1
Potassium	2.95		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 21:35	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 21:35	1
Sodium	4.02		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 21:35	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 21:35	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 10:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.53		0.100	0.100	SU			07/18/18 10:21	1
Temperature	19.4		0.100	0.100	Degrees C			07/18/18 10:21	1
Alkalinity	85.8		10.0	5.00	mg/L			07/24/18 13:43	1
Total Dissolved Solids	156		10.0	7.00	mg/L			07/13/18 23:45	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.423		0.157	0.162	1.00	0.123	pCi/L	07/18/18 09:53	08/09/18 06:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.3		40 - 110					07/18/18 09:53	08/09/18 06:11	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 04B 071218

Lab Sample ID: 490-155625-8

Date Collected: 07/12/18 12:55

Matrix: Water

Date Received: 07/13/18 10:10

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.277	U	0.249	0.250	1.00	0.502	pCi/L	07/18/18 10:47	08/01/18 16:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.3		40 - 110					07/18/18 10:47	08/01/18 16:51	1
Y Carrier	89.0		40 - 110					07/18/18 10:47	08/01/18 16:51	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.423	U	0.294	0.298	5.00	0.502	pCi/L		08/16/18 13:40	1



QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 490-529755/3
Matrix: Water
Analysis Batch: 529755

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.2299	J	3.00	0.200	mg/L			07/19/18 01:26	1
Fluoride	ND		1.00	0.0100	mg/L			07/19/18 01:26	1
Sulfate	ND		5.00	0.0300	mg/L			07/19/18 01:26	1

Lab Sample ID: LCS 490-529755/4
Matrix: Water
Analysis Batch: 529755

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.340		mg/L		93	80 - 120
Fluoride	1.00	0.9436	J	mg/L		94	80 - 120
Sulfate	10.0	9.177		mg/L		92	80 - 120

Lab Sample ID: LCSD 490-529755/5
Matrix: Water
Analysis Batch: 529755

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.258		mg/L		92	80 - 120	1	20
Fluoride	1.00	0.9306	J	mg/L		93	80 - 120	1	20
Sulfate	10.0	9.183		mg/L		92	80 - 120	0	20

Lab Sample ID: 490-155625-1 MS
Matrix: Water
Analysis Batch: 529755

Client Sample ID: River 01A 071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	4.58	B	10.0	15.84		mg/L		112	80 - 120
Fluoride	0.111	J	1.00	1.158		mg/L		105	80 - 120
Sulfate	28.5		10.0	39.82		mg/L		113	80 - 120

Lab Sample ID: 490-155625-1 MSD
Matrix: Water
Analysis Batch: 529755

Client Sample ID: River 01A 071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	4.58	B	10.0	14.00		mg/L		94	80 - 120	12	20
Fluoride	0.111	J	1.00	0.9991	J	mg/L		89	80 - 120	15	20
Sulfate	28.5		10.0	38.02		mg/L		95	80 - 120	5	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 180-250893/1-A
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 250893

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:28	07/24/18 13:59	1

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 180-250893/2-A
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250893

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.022		mg/L		102	80 - 120

Lab Sample ID: 490-155625-1 MS
Matrix: Water
Analysis Batch: 251527

Client Sample ID: River 01A 071218
Prep Type: Total Recoverable
Prep Batch: 250893

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	ND		1.00	1.007		mg/L		101	75 - 125

Lab Sample ID: 490-155625-1 MSD
Matrix: Water
Analysis Batch: 251527

Client Sample ID: River 01A 071218
Prep Type: Total Recoverable
Prep Batch: 250893

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	ND		1.00	0.9816		mg/L		98	75 - 125	3	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-250895/1-A
Matrix: Water
Analysis Batch: 251631

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 250895

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00006100	J	0.00200	0.0000213	mg/L		07/18/18 12:33	07/24/18 20:21	1
Arsenic	ND		0.00500	0.000118	mg/L		07/18/18 12:33	07/24/18 20:21	1
Barium	ND		0.200	0.000270	mg/L		07/18/18 12:33	07/24/18 20:21	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:33	07/24/18 20:21	1
Boron	ND		1.00	0.00339	mg/L		07/18/18 12:33	07/24/18 20:21	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:33	07/24/18 20:21	1
Calcium	ND		1.00	0.0412	mg/L		07/18/18 12:33	07/24/18 20:21	1
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:33	07/24/18 20:21	1
Cobalt	ND		0.00500	0.0000218	mg/L		07/18/18 12:33	07/24/18 20:21	1
Lead	0.0001510	J	0.00500	0.0000675	mg/L		07/18/18 12:33	07/24/18 20:21	1
Magnesium	ND		1.00	0.0152	mg/L		07/18/18 12:33	07/24/18 20:21	1
Molybdenum	ND		0.0100	0.000873	mg/L		07/18/18 12:33	07/24/18 20:21	1
Potassium	ND		1.00	0.136	mg/L		07/18/18 12:33	07/24/18 20:21	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:33	07/24/18 20:21	1
Sodium	ND		1.00	0.251	mg/L		07/18/18 12:33	07/24/18 20:21	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:33	07/24/18 20:21	1

Lab Sample ID: LCS 180-250895/2-A
Matrix: Water
Analysis Batch: 251631

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250895

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.500	0.4898		mg/L		98	80 - 120
Arsenic	0.0400	0.03842		mg/L		96	80 - 120
Barium	2.00	1.925		mg/L		96	80 - 120
Beryllium	0.0500	0.04875		mg/L		98	80 - 120

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

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

Lab Sample ID: LCS 180-250895/2-A
Matrix: Water
Analysis Batch: 251631

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250895

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	0.8867	J	mg/L		89	80 - 120
Cadmium	0.0500	0.05068		mg/L		101	80 - 120
Calcium	50.0	45.32		mg/L		91	80 - 120
Chromium	0.200	0.1705		mg/L		85	80 - 120
Cobalt	0.500	0.4476		mg/L		90	80 - 120
Lead	0.0200	0.02129		mg/L		106	80 - 120
Magnesium	50.0	46.73		mg/L		93	80 - 120
Molybdenum	1.00	0.9723		mg/L		97	80 - 120
Potassium	50.0	46.91		mg/L		94	80 - 120
Selenium	0.0100	0.01009		mg/L		101	80 - 120
Sodium	50.0	45.47		mg/L		91	80 - 120
Thallium	0.0500	0.04991		mg/L		100	80 - 120

Lab Sample ID: 490-155625-2 MS
Matrix: Water
Analysis Batch: 251631

Client Sample ID: River 01B 071218
Prep Type: Total Recoverable
Prep Batch: 250895

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.000476	J B	0.500	0.5115		mg/L		102	75 - 125
Arsenic	0.00137	J	0.0400	0.03802		mg/L		92	75 - 125
Barium	0.0374	J	2.00	2.033		mg/L		100	75 - 125
Beryllium	ND		0.0500	0.05153		mg/L		103	75 - 125
Boron	0.0252	J	1.00	0.9333	J	mg/L		91	75 - 125
Cadmium	ND		0.0500	0.05330		mg/L		107	75 - 125
Calcium	33.2		50.0	85.40		mg/L		105	75 - 125
Chromium	0.00143	J	0.200	0.1788		mg/L		89	75 - 125
Cobalt	0.000623	J	0.500	0.4717		mg/L		94	75 - 125
Lead	0.00600	B	0.0200	0.02673		mg/L		104	75 - 125
Magnesium	6.62		50.0	53.36		mg/L		93	75 - 125
Molybdenum	0.00130	J	1.00	1.007		mg/L		101	75 - 125
Potassium	2.91		50.0	50.11		mg/L		94	75 - 125
Selenium	ND	F2	0.0100	0.01048		mg/L		105	75 - 125
Sodium	3.95		50.0	49.36		mg/L		91	75 - 125
Thallium	ND		0.0500	0.05030		mg/L		101	75 - 125

Lab Sample ID: 490-155625-2 MSD
Matrix: Water
Analysis Batch: 251631

Client Sample ID: River 01B 071218
Prep Type: Total Recoverable
Prep Batch: 250895

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.000476	J B	0.500	0.5014		mg/L		100	75 - 125	2	20
Arsenic	0.00137	J	0.0400	0.03845		mg/L		93	75 - 125	1	20
Barium	0.0374	J	2.00	2.037		mg/L		100	75 - 125	0	20
Beryllium	ND		0.0500	0.05205		mg/L		104	75 - 125	1	20
Boron	0.0252	J	1.00	0.9436	J	mg/L		92	75 - 125	1	20
Cadmium	ND		0.0500	0.05239		mg/L		105	75 - 125	2	20
Calcium	33.2		50.0	86.42		mg/L		107	75 - 125	1	20
Chromium	0.00143	J	0.200	0.1794		mg/L		89	75 - 125	0	20
Cobalt	0.000623	J	0.500	0.4642		mg/L		93	75 - 125	2	20

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

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

Lab Sample ID: 490-155625-2 MSD
Matrix: Water
Analysis Batch: 251631

Client Sample ID: River 01B 071218
Prep Type: Total Recoverable
Prep Batch: 250895

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits		
Lead	0.00600	B	0.0200	0.02698		mg/L		105	75 - 125	1	20
Magnesium	6.62		50.0	54.66		mg/L		96	75 - 125	2	20
Molybdenum	0.00130	J	1.00	0.9933		mg/L		99	75 - 125	1	20
Potassium	2.91		50.0	50.03		mg/L		94	75 - 125	0	20
Selenium	ND	F2	0.0100	0.008497	J F2	mg/L		85	75 - 125	21	20
Sodium	3.95		50.0	50.61		mg/L		93	75 - 125	3	20
Thallium	ND		0.0500	0.04967		mg/L		99	75 - 125	1	20

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-250921/1-A
Matrix: Water
Analysis Batch: 251171

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 250921

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	ND		0.200	0.0653	ug/L		07/19/18 07:20	07/20/18 09:44	1

Lab Sample ID: LCS 180-250921/2-A
Matrix: Water
Analysis Batch: 251171

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 250921

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec.
		Result	Qualifier				Limits
Mercury	2.50	2.427		ug/L		97	80 - 120

Lab Sample ID: 180-79763-F-6-C MS
Matrix: Water
Analysis Batch: 251171

Client Sample ID: Matrix Spike
Prep Type: Dissolved
Prep Batch: 250921

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.
	Result	Qualifier		Result	Qualifier				Limits
Mercury	ND		1.00	0.8990		ug/L		90	75 - 125

Lab Sample ID: 180-79763-F-6-D MSD
Matrix: Water
Analysis Batch: 251171

Client Sample ID: Matrix Spike Duplicate
Prep Type: Dissolved
Prep Batch: 250921

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits		
Mercury	ND		1.00	0.9260		ug/L		93	75 - 125	3	20

Method: 9040C - pH

Lab Sample ID: LCS 490-529671/1
Matrix: Water
Analysis Batch: 529671

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

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec.
		Result	Qualifier				Limits
pH	7.00	6.970		SU		100	98 - 103

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Method: 9040C - pH (Continued)

Lab Sample ID: 490-155638-D-10 DU
Matrix: Water
Analysis Batch: 529671

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	RPD	
			Result	Qualifier				RPD	Limit
pH	5.78		5.750		SU		0.5	20	
Temperature	18.9		18.50		Degrees C		2	20	

Lab Sample ID: LCS 490-529685/1
Matrix: Water
Analysis Batch: 529685

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
							Limits	
pH	7.00	6.970		SU		100	98 - 103	

Lab Sample ID: 490-155625-3 DU
Matrix: Water
Analysis Batch: 529685

Client Sample ID: River 02A 071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	RPD	
			Result	Qualifier				RPD	Limit
pH	7.45		7.490		SU		0.5	20	
Temperature	19.8		19.80		Degrees C		0	20	

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-531384/13
Matrix: Water
Analysis Batch: 531384

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

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Alkalinity	ND		10.0	5.00	mg/L			07/24/18 11:54	1

Lab Sample ID: LCS 490-531384/14
Matrix: Water
Analysis Batch: 531384

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
							Limits	
Alkalinity	100	102.9		mg/L		103	90 - 110	

Lab Sample ID: LCSD 490-531384/36
Matrix: Water
Analysis Batch: 531384

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	Limit
							Limits			
Alkalinity	100	96.04		mg/L		96	90 - 110	7	20	

Lab Sample ID: 490-155625-5 DU
Matrix: Water
Analysis Batch: 531384

Client Sample ID: River 03A 071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	RPD	
			Result	Qualifier				RPD	Limit
Alkalinity	86.1		86.60		mg/L		0.6	20	

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 490-525387/1
Matrix: Water
Analysis Batch: 525387

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10.0	7.00	mg/L			07/13/18 23:45	1

Lab Sample ID: LCS 490-525387/2
Matrix: Water
Analysis Batch: 525387

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	100	107.0		mg/L		107	90 - 110

Lab Sample ID: 490-155592-A-1 DU
Matrix: Water
Analysis Batch: 525387

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	291.0		305.0		mg/L		5	20

Lab Sample ID: 490-155625-5 DU
Matrix: Water
Analysis Batch: 525387

Client Sample ID: River 03A 071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	175		170.0		mg/L		3	20

Lab Sample ID: MB 490-525388/1
Matrix: Water
Analysis Batch: 525388

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10.0	7.00	mg/L			07/13/18 21:20	1

Lab Sample ID: LCS 490-525388/2
Matrix: Water
Analysis Batch: 525388

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	100	107.0		mg/L		107	90 - 110

Lab Sample ID: 490-155300-J-1 DU
Matrix: Water
Analysis Batch: 525388

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	256		255.0		mg/L		0.4	20

Lab Sample ID: 490-155625-4 DU
Matrix: Water
Analysis Batch: 525388

Client Sample ID: River 02B 071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	170		167.0		mg/L		2	20

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-376411/23-A
Matrix: Water
Analysis Batch: 381214

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 376411

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.3070		0.119	0.122	1.00	0.128	pCi/L	07/18/18 09:53	08/09/18 08:07	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110					07/18/18 09:53	08/09/18 08:07	1

Lab Sample ID: LCS 160-376411/1-A
Matrix: Water
Analysis Batch: 381214

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 376411

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	15.1	14.12		1.45	1.00	0.135	pCi/L	93	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	97.9		40 - 110						

Lab Sample ID: 600-169201-B-1-A DU
Matrix: Water
Analysis Batch: 381214

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 376411

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-226	0.203		0.2067		0.0859	1.00	0.0785	pCi/L	0.02	1
Carrier	DU %Yield	DU Qualifier	Limits							
Ba Carrier	100		40 - 110							

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-376424/23-A
Matrix: Water
Analysis Batch: 379713

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 376424

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1873	U	0.219	0.220	1.00	0.362	pCi/L	07/18/18 10:47	08/01/18 16:54	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110					07/18/18 10:47	08/01/18 16:54	1
Y Carrier	89.0		40 - 110					07/18/18 10:47	08/01/18 16:54	1

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-376424/1-A
Matrix: Water
Analysis Batch: 379720

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 376424

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	14.9	13.44		1.48	1.00	0.437	pCi/L	90	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	97.9		40 - 110
Y Carrier	93.8		40 - 110

Lab Sample ID: 600-169201-B-1-B DU
Matrix: Water
Analysis Batch: 379720

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 376424

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-228	-0.0457	U	-0.06516	U	0.160	1.00	0.300	pCi/L	0.06	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	100		40 - 110
Y Carrier	92.7		40 - 110

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Lab Sample ID: 180-78050-A-1 DU
Matrix: Water
Analysis Batch: 382940

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Combined Radium 226 + 228	0.193	U	0.3728	U	0.293	5.00	0.454	pCi/L	0.33	

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

HPLC/IC

Analysis Batch: 529755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total/NA	Water	9056A	
490-155625-2	River 01B 071218	Total/NA	Water	9056A	
490-155625-3	River 02A 071218	Total/NA	Water	9056A	
490-155625-4	River 02B 071218	Total/NA	Water	9056A	
490-155625-5	River 03A 071218	Total/NA	Water	9056A	
490-155625-6	River 03B 071218	Total/NA	Water	9056A	
490-155625-7	River 04A 071218	Total/NA	Water	9056A	
490-155625-8	River 04B 071218	Total/NA	Water	9056A	
MB 490-529755/3	Method Blank	Total/NA	Water	9056A	
LCS 490-529755/4	Lab Control Sample	Total/NA	Water	9056A	
LCS D 490-529755/5	Lab Control Sample Dup	Total/NA	Water	9056A	
490-155625-1 MS	River 01A 071218	Total/NA	Water	9056A	
490-155625-1 MSD	River 01A 071218	Total/NA	Water	9056A	

Metals

Prep Batch: 250893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total Recoverable	Water	3005A	
490-155625-2	River 01B 071218	Total Recoverable	Water	3005A	
490-155625-3	River 02A 071218	Total Recoverable	Water	3005A	
490-155625-4	River 02B 071218	Total Recoverable	Water	3005A	
490-155625-5	River 03A 071218	Total Recoverable	Water	3005A	
490-155625-6	River 03B 071218	Total Recoverable	Water	3005A	
490-155625-7	River 04A 071218	Total Recoverable	Water	3005A	
490-155625-8	River 04B 071218	Total Recoverable	Water	3005A	
MB 180-250893/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-250893/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
490-155625-1 MS	River 01A 071218	Total Recoverable	Water	3005A	
490-155625-1 MSD	River 01A 071218	Total Recoverable	Water	3005A	

Prep Batch: 250895

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total Recoverable	Water	3005A	
490-155625-2	River 01B 071218	Total Recoverable	Water	3005A	
490-155625-3	River 02A 071218	Total Recoverable	Water	3005A	
490-155625-4	River 02B 071218	Total Recoverable	Water	3005A	
490-155625-5	River 03A 071218	Total Recoverable	Water	3005A	
490-155625-6	River 03B 071218	Total Recoverable	Water	3005A	
490-155625-7	River 04A 071218	Total Recoverable	Water	3005A	
490-155625-8	River 04B 071218	Total Recoverable	Water	3005A	
MB 180-250895/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-250895/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
490-155625-2 MS	River 01B 071218	Total Recoverable	Water	3005A	
490-155625-2 MSD	River 01B 071218	Total Recoverable	Water	3005A	

Prep Batch: 250921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total/NA	Water	7470A	
490-155625-2	River 01B 071218	Total/NA	Water	7470A	

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Metals (Continued)

Prep Batch: 250921 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-3	River 02A 071218	Total/NA	Water	7470A	
490-155625-4	River 02B 071218	Total/NA	Water	7470A	
490-155625-5	River 03A 071218	Total/NA	Water	7470A	
490-155625-6	River 03B 071218	Total/NA	Water	7470A	
490-155625-7	River 04A 071218	Total/NA	Water	7470A	
490-155625-8	River 04B 071218	Total/NA	Water	7470A	
MB 180-250921/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-250921/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-79763-F-6-C MS	Matrix Spike	Dissolved	Water	7470A	
180-79763-F-6-D MSD	Matrix Spike Duplicate	Dissolved	Water	7470A	

Analysis Batch: 251171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total/NA	Water	EPA 7470A	250921
490-155625-2	River 01B 071218	Total/NA	Water	EPA 7470A	250921
490-155625-3	River 02A 071218	Total/NA	Water	EPA 7470A	250921
490-155625-4	River 02B 071218	Total/NA	Water	EPA 7470A	250921
490-155625-5	River 03A 071218	Total/NA	Water	EPA 7470A	250921
490-155625-6	River 03B 071218	Total/NA	Water	EPA 7470A	250921
490-155625-7	River 04A 071218	Total/NA	Water	EPA 7470A	250921
490-155625-8	River 04B 071218	Total/NA	Water	EPA 7470A	250921
MB 180-250921/1-A	Method Blank	Total/NA	Water	EPA 7470A	250921
LCS 180-250921/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	250921
180-79763-F-6-C MS	Matrix Spike	Dissolved	Water	EPA 7470A	250921
180-79763-F-6-D MSD	Matrix Spike Duplicate	Dissolved	Water	EPA 7470A	250921

Analysis Batch: 251527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total Recoverable	Water	6010C	250893
490-155625-2	River 01B 071218	Total Recoverable	Water	6010C	250893
490-155625-3	River 02A 071218	Total Recoverable	Water	6010C	250893
490-155625-4	River 02B 071218	Total Recoverable	Water	6010C	250893
490-155625-5	River 03A 071218	Total Recoverable	Water	6010C	250893
490-155625-6	River 03B 071218	Total Recoverable	Water	6010C	250893
490-155625-7	River 04A 071218	Total Recoverable	Water	6010C	250893
490-155625-8	River 04B 071218	Total Recoverable	Water	6010C	250893
MB 180-250893/1-A	Method Blank	Total Recoverable	Water	6010C	250893
LCS 180-250893/2-A	Lab Control Sample	Total Recoverable	Water	6010C	250893
490-155625-1 MS	River 01A 071218	Total Recoverable	Water	6010C	250893
490-155625-1 MSD	River 01A 071218	Total Recoverable	Water	6010C	250893

Analysis Batch: 251631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total Recoverable	Water	6020A	250895
490-155625-2	River 01B 071218	Total Recoverable	Water	6020A	250895
490-155625-3	River 02A 071218	Total Recoverable	Water	6020A	250895
490-155625-4	River 02B 071218	Total Recoverable	Water	6020A	250895
490-155625-5	River 03A 071218	Total Recoverable	Water	6020A	250895
490-155625-6	River 03B 071218	Total Recoverable	Water	6020A	250895
490-155625-7	River 04A 071218	Total Recoverable	Water	6020A	250895
490-155625-8	River 04B 071218	Total Recoverable	Water	6020A	250895

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Metals (Continued)

Analysis Batch: 251631 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 180-250895/1-A	Method Blank	Total Recoverable	Water	6020A	250895
LCS 180-250895/2-A	Lab Control Sample	Total Recoverable	Water	6020A	250895
490-155625-2 MS	River 01B 071218	Total Recoverable	Water	6020A	250895
490-155625-2 MSD	River 01B 071218	Total Recoverable	Water	6020A	250895

General Chemistry

Analysis Batch: 525387

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-5	River 03A 071218	Total/NA	Water	SM 2540C	
490-155625-6	River 03B 071218	Total/NA	Water	SM 2540C	
490-155625-7	River 04A 071218	Total/NA	Water	SM 2540C	
490-155625-8	River 04B 071218	Total/NA	Water	SM 2540C	
MB 490-525387/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 490-525387/2	Lab Control Sample	Total/NA	Water	SM 2540C	
490-155592-A-1 DU	Duplicate	Total/NA	Water	SM 2540C	
490-155625-5 DU	River 03A 071218	Total/NA	Water	SM 2540C	

Analysis Batch: 525388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total/NA	Water	SM 2540C	
490-155625-2	River 01B 071218	Total/NA	Water	SM 2540C	
490-155625-3	River 02A 071218	Total/NA	Water	SM 2540C	
490-155625-4	River 02B 071218	Total/NA	Water	SM 2540C	
MB 490-525388/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 490-525388/2	Lab Control Sample	Total/NA	Water	SM 2540C	
490-155300-J-1 DU	Duplicate	Total/NA	Water	SM 2540C	
490-155625-4 DU	River 02B 071218	Total/NA	Water	SM 2540C	

Analysis Batch: 529671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total/NA	Water	9040C	
490-155625-2	River 01B 071218	Total/NA	Water	9040C	
LCS 490-529671/1	Lab Control Sample	Total/NA	Water	9040C	
490-155638-D-10 DU	Duplicate	Total/NA	Water	9040C	

Analysis Batch: 529685

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-3	River 02A 071218	Total/NA	Water	9040C	
490-155625-4	River 02B 071218	Total/NA	Water	9040C	
490-155625-5	River 03A 071218	Total/NA	Water	9040C	
490-155625-6	River 03B 071218	Total/NA	Water	9040C	
490-155625-7	River 04A 071218	Total/NA	Water	9040C	
490-155625-8	River 04B 071218	Total/NA	Water	9040C	
LCS 490-529685/1	Lab Control Sample	Total/NA	Water	9040C	
490-155625-3 DU	River 02A 071218	Total/NA	Water	9040C	

Analysis Batch: 531384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total/NA	Water	SM 2320B	

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

General Chemistry (Continued)

Analysis Batch: 531384 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-2	River 01B 071218	Total/NA	Water	SM 2320B	
490-155625-3	River 02A 071218	Total/NA	Water	SM 2320B	
490-155625-4	River 02B 071218	Total/NA	Water	SM 2320B	
490-155625-5	River 03A 071218	Total/NA	Water	SM 2320B	
490-155625-6	River 03B 071218	Total/NA	Water	SM 2320B	
490-155625-7	River 04A 071218	Total/NA	Water	SM 2320B	
490-155625-8	River 04B 071218	Total/NA	Water	SM 2320B	
MB 490-531384/13	Method Blank	Total/NA	Water	SM 2320B	
LCS 490-531384/14	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-531384/36	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
490-155625-5 DU	River 03A 071218	Total/NA	Water	SM 2320B	

Rad

Prep Batch: 376411

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total/NA	Water	PrecSep-21	
490-155625-2	River 01B 071218	Total/NA	Water	PrecSep-21	
490-155625-3	River 02A 071218	Total/NA	Water	PrecSep-21	
490-155625-4	River 02B 071218	Total/NA	Water	PrecSep-21	
490-155625-5	River 03A 071218	Total/NA	Water	PrecSep-21	
490-155625-6	River 03B 071218	Total/NA	Water	PrecSep-21	
490-155625-7	River 04A 071218	Total/NA	Water	PrecSep-21	
490-155625-8	River 04B 071218	Total/NA	Water	PrecSep-21	
MB 160-376411/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-376411/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
600-169201-B-1-A DU	Duplicate	Total/NA	Water	PrecSep-21	

Prep Batch: 376424

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155625-1	River 01A 071218	Total/NA	Water	PrecSep_0	
490-155625-2	River 01B 071218	Total/NA	Water	PrecSep_0	
490-155625-3	River 02A 071218	Total/NA	Water	PrecSep_0	
490-155625-4	River 02B 071218	Total/NA	Water	PrecSep_0	
490-155625-5	River 03A 071218	Total/NA	Water	PrecSep_0	
490-155625-6	River 03B 071218	Total/NA	Water	PrecSep_0	
490-155625-7	River 04A 071218	Total/NA	Water	PrecSep_0	
490-155625-8	River 04B 071218	Total/NA	Water	PrecSep_0	
MB 160-376424/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-376424/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
600-169201-B-1-B DU	Duplicate	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 01A 071218

Lab Sample ID: 490-155625-1

Date Collected: 07/12/18 11:10

Matrix: Water

Date Received: 07/13/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			529755	07/19/18 02:20	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250893	07/18/18 12:28	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 14:09	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250895	07/18/18 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			251631	07/24/18 20:31	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250921	07/19/18 07:20	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 10:03	RJR	TAL PIT
Total/NA	Analysis	9040C		1			529671	07/18/18 10:03	AJK	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 12:48	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	525388	07/13/18 21:20	AEC	TAL NSH
Total/NA	Prep	PrecSep-21			750.47 mL	1.0 g	376411	07/18/18 09:53	JLC	TAL SL
Total/NA	Analysis	903.0		1			381214	08/09/18 06:09	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.47 mL	1.0 g	376424	07/18/18 10:47	JLC	TAL SL
Total/NA	Analysis	904.0		1			379720	08/01/18 16:50	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382940	08/16/18 13:40	RTM	TAL SL

Client Sample ID: River 01B 071218

Lab Sample ID: 490-155625-2

Date Collected: 07/12/18 11:30

Matrix: Water

Date Received: 07/13/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			529755	07/19/18 03:15	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250893	07/18/18 12:28	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 14:30	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250895	07/18/18 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			251631	07/24/18 20:35	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250921	07/19/18 07:20	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 10:04	RJR	TAL PIT
Total/NA	Analysis	9040C		1			529671	07/18/18 10:03	AJK	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 12:55	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	525388	07/13/18 21:20	AEC	TAL NSH
Total/NA	Prep	PrecSep-21			749.80 mL	1.0 g	376411	07/18/18 09:53	JLC	TAL SL
Total/NA	Analysis	903.0		1			381227	08/09/18 06:10	RTM	TAL SL
Total/NA	Prep	PrecSep_0			749.80 mL	1.0 g	376424	07/18/18 10:47	JLC	TAL SL
Total/NA	Analysis	904.0		1			379720	08/01/18 16:50	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382940	08/16/18 13:40	RTM	TAL SL

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 02A 071218

Lab Sample ID: 490-155625-3

Date Collected: 07/12/18 11:50

Matrix: Water

Date Received: 07/13/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			529755	07/19/18 03:33	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250893	07/18/18 12:28	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 14:35	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250895	07/18/18 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			251631	07/24/18 20:58	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250921	07/19/18 07:20	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 10:05	RJR	TAL PIT
Total/NA	Analysis	9040C		1			529685	07/18/18 10:21	AJK	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 13:02	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	525388	07/13/18 21:20	AEC	TAL NSH
Total/NA	Prep	PrecSep-21			750.09 mL	1.0 g	376411	07/18/18 09:53	JLC	TAL SL
Total/NA	Analysis	903.0		1			381227	08/09/18 06:10	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.09 mL	1.0 g	376424	07/18/18 10:47	JLC	TAL SL
Total/NA	Analysis	904.0		1			379720	08/01/18 16:51	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382940	08/16/18 13:40	RTM	TAL SL

Client Sample ID: River 02B 071218

Lab Sample ID: 490-155625-4

Date Collected: 07/12/18 12:00

Matrix: Water

Date Received: 07/13/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			529755	07/19/18 03:51	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250893	07/18/18 12:28	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 14:41	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250895	07/18/18 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			251631	07/24/18 21:03	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250921	07/19/18 07:20	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 10:06	RJR	TAL PIT
Total/NA	Analysis	9040C		1			529685	07/18/18 10:21	AJK	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 13:09	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	525388	07/13/18 21:20	AEC	TAL NSH
Total/NA	Prep	PrecSep-21			750.19 mL	1.0 g	376411	07/18/18 09:53	JLC	TAL SL
Total/NA	Analysis	903.0		1			381227	08/09/18 06:11	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.19 mL	1.0 g	376424	07/18/18 10:47	JLC	TAL SL
Total/NA	Analysis	904.0		1			379720	08/01/18 16:51	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382940	08/16/18 13:40	RTM	TAL SL

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 03A 071218

Lab Sample ID: 490-155625-5

Date Collected: 07/12/18 12:15

Matrix: Water

Date Received: 07/13/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			529755	07/19/18 04:09	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250893	07/18/18 12:28	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 14:56	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250895	07/18/18 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			251631	07/24/18 21:21	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250921	07/19/18 07:20	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 10:07	RJR	TAL PIT
Total/NA	Analysis	9040C		1			529685	07/18/18 10:21	AJK	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 13:16	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	525387	07/13/18 23:45	AEC	TAL NSH
Total/NA	Prep	PrecSep-21			750.13 mL	1.0 g	376411	07/18/18 09:53	JLC	TAL SL
Total/NA	Analysis	903.0		1			381227	08/09/18 06:11	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.13 mL	1.0 g	376424	07/18/18 10:47	JLC	TAL SL
Total/NA	Analysis	904.0		1			379720	08/01/18 16:51	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382940	08/16/18 13:40	RTM	TAL SL

Client Sample ID: River 03B 071218

Lab Sample ID: 490-155625-6

Date Collected: 07/12/18 12:20

Matrix: Water

Date Received: 07/13/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			529755	07/19/18 04:27	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250893	07/18/18 12:28	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 15:02	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250895	07/18/18 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			251631	07/24/18 21:25	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250921	07/19/18 07:20	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 10:08	RJR	TAL PIT
Total/NA	Analysis	9040C		1			529685	07/18/18 10:21	AJK	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 13:29	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	525387	07/13/18 23:45	AEC	TAL NSH
Total/NA	Prep	PrecSep-21			749.72 mL	1.0 g	376411	07/18/18 09:53	JLC	TAL SL
Total/NA	Analysis	903.0		1			381227	08/09/18 06:11	RTM	TAL SL
Total/NA	Prep	PrecSep_0			749.72 mL	1.0 g	376424	07/18/18 10:47	JLC	TAL SL
Total/NA	Analysis	904.0		1			379720	08/01/18 16:51	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382940	08/16/18 13:40	RTM	TAL SL

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Client Sample ID: River 04A 071218

Lab Sample ID: 490-155625-7

Date Collected: 07/12/18 12:45

Matrix: Water

Date Received: 07/13/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			529755	07/19/18 04:45	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250893	07/18/18 12:28	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 15:07	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250895	07/18/18 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			251631	07/24/18 21:30	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250921	07/19/18 07:20	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 10:09	RJR	TAL PIT
Total/NA	Analysis	9040C		1			529685	07/18/18 10:21	AJK	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 13:36	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	525387	07/13/18 23:45	AEC	TAL NSH
Total/NA	Prep	PrecSep-21			749.76 mL	1.0 g	376411	07/18/18 09:53	JLC	TAL SL
Total/NA	Analysis	903.0		1			381227	08/09/18 06:11	RTM	TAL SL
Total/NA	Prep	PrecSep_0			749.76 mL	1.0 g	376424	07/18/18 10:47	JLC	TAL SL
Total/NA	Analysis	904.0		1			379720	08/01/18 16:51	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382940	08/16/18 13:40	RTM	TAL SL

Client Sample ID: River 04B 071218

Lab Sample ID: 490-155625-8

Date Collected: 07/12/18 12:55

Matrix: Water

Date Received: 07/13/18 10:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			529755	07/19/18 05:03	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250893	07/18/18 12:28	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 15:12	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250895	07/18/18 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			251631	07/24/18 21:35	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250921	07/19/18 07:20	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 10:10	RJR	TAL PIT
Total/NA	Analysis	9040C		1			529685	07/18/18 10:21	AJK	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 13:43	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	525387	07/13/18 23:45	AEC	TAL NSH
Total/NA	Prep	PrecSep-21			750.03 mL	1.0 g	376411	07/18/18 09:53	JLC	TAL SL
Total/NA	Analysis	903.0		1			381227	08/09/18 06:11	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.03 mL	1.0 g	376424	07/18/18 10:47	JLC	TAL SL
Total/NA	Analysis	904.0		1			379720	08/01/18 16:51	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			382940	08/16/18 13:40	RTM	TAL SL

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Method Summary

Client: Big Rivers Electric Corporation
Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL NSH
6010C	Metals (ICP)	SW846	TAL PIT
6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
9040C	pH	SW846	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL NSH
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT

Protocol References:

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

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

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Accreditation/Certification Summary

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Laboratory: TestAmerica Nashville

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kentucky (UST)	State Program	4	19	06-30-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9040C		Water	pH
9040C		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate
SM 2320B		Water	Alkalinity
SM 2540C		Water	Total Dissolved Solids

Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-19
California	State Program	9	2891	04-30-19
Connecticut	State Program	1	PH-0688	09-30-18
Florida	NELAP	4	E871008	06-30-19
Illinois	NELAP	5	200005	06-30-19
Kansas	NELAP	7	E-10350	01-31-19
Louisiana	NELAP	6	04041	06-30-19
Nevada	State Program	9	PA00164	07-31-19
New Hampshire	NELAP	1	2030	04-04-19
New Jersey	NELAP	2	PA005	06-30-19
New York	NELAP	2	11182	03-31-19
North Carolina (WW/SW)	State Program	4	434	12-31-18
Oregon	NELAP	10	PA-2151	01-28-19
Pennsylvania	NELAP	3	02-00416	04-30-19
South Carolina	State Program	4	89014	04-30-18 *
Texas	NELAP	6	T104704528-15-2	03-31-19
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-19
Virginia	NELAP	3	460189	09-14-18 *
West Virginia DEP	State Program	3	142	01-31-19
Wisconsin	State Program	5	998027800	08-31-18

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18 *
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-18 *
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18 *
West Virginia DEP	State Program	3	381	08-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.



490-155625 Chain of Custody

COOLER RECEIPT FORM

Cooler Received/Opened On 7/13/2018 @ 1010

Time Samples Removed From Cooler 1404 Time Samples Placed In Storage 1425 (2 Hour Window)

1. Tracking # 9868 (last 4 digits, FedEx) Courier: FedEx
IR Gun ID 17960357 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 15 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) EA

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # 04

I certify that I unloaded the cooler and answered questions 7-14 (initial) GH

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) GH

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) GH

I certify that I attached a label with the unique LIMS number to each container (initial) GH

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#

COOLER RECEIPT FORM

Cooler Received/Opened On 7/13/2018 @1010

Time Samples Removed From Cooler 1404 Time Samples Placed In Storage 1425 (2 Hour Window)

1. Tracking # 9857 (last 4 digits, FedEx) Courier: FedEx
IR Gun ID 17960358 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 13 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) an

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # GH

I certify that I unloaded the cooler and answered questions 7-14 (initial) GH

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) GH

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) GH

I certify that I attached a label with the unique LIMS number to each container (initial) GH

21. Were there Non-Conformance issues at login? YES...NO...# Was a NCM generated? YES...NO...#

Chain of Custody Record

Client Information		Lab PM: Cisneros, Roxanne		Carrier Tracking No(s): <i>Fedex</i>		COC No: 490-86693-25173.2	
Client Contact: Greg Dick		E-Mail: roxanne.cisneros@testamericainc.com		Page 1 of 2		Job #:	
Company: Big Rivers Electric Corporation		Address: PO BOX 24		City: Henderson		State, Zip: KY, 42419	
Phone: 270-844-6010(Tel)		PO #: Purchase Order - see DOCS		VO #:		Email: Gregory.Dick@bigrivers.com	
Project Name: Big Rivers Electric Corp - Henderson KY		Project #: 49002917		SSOW#:		Site: <i>Green Landfill</i>	
Due Date Requested: <i>Standard</i>		TAT Requested (days): <i>Standard</i>		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)	
Sample Date		Sample Time		Sample Type (G=Grab)		Matrix (W=Water, S=solid, O=soil, BT=issue, A=Air)	
Sample Identification		Sample Date		Sample Time		Sample Type (G=Grab)	
River #1A	071218	7-12-18	11:10	G	Water	N	N
River #1B	071218	7-12-18	11:30	G	Water	N	N
River #2A	071218	7-12-18	11:50	G	Water	N	N
River #2B	071218	7-12-18	12:00	G	Water	N	N
River #3A	071218	7-12-18	12:15	G	Water	N	N
River #3B	071218	7-12-18	12:20	G	Water	N	N
River #4A	071218	7-12-18	12:45	G	Water	N	N
River #4B	071218	7-12-18	12:55	G	Water	N	N
Possible Hazard Identification		<input type="checkbox"/> Non-Hazard		<input type="checkbox"/> Flammable		<input type="checkbox"/> Skin Irritant	
<input type="checkbox"/> Poison B		<input checked="" type="checkbox"/> Unknown		<input type="checkbox"/> Radiological		<input type="checkbox"/> Other (specify)	
Deliverable Requested: I, II, III, IV, Other (specify)		Empty Kit Relinquished by:		Date:		Time:	
Relinquished by: <i>[Signature]</i>		Date/Time: 7/12/18 17:00		Company: <i>ARCOM</i>		Received by: <i>[Signature]</i>	
Relinquished by:		Date/Time:		Company:		Received by:	
Relinquished by:		Date/Time:		Company:		Received by:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <i>0.5 / 1.3</i>		Company: <i>TA-NAS</i>	



TestAmerica Nashville
 2980 Foster Creighton Drive
 Nashville, TN 37204
 Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record



TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:						
Client Contact: TestAmerica Laboratories, Inc.		Phone:	Cisneros, Roxanne	490-75461.1	490-75461.1						
Shipping/Receiving:		Email:	roxanne.cisneros@testamericainc.com	State of Origin:	Page: 1 of 1						
Address: 13715 Rider Trail North,		Accreditations Required (See note):	State Program - Kentucky (UST)		Lab #:						
City: Earth City		Due Date Requested:	490-155625-1								
State Zip: MO, 63045		TAT Requested (days):	7/25/2018								
Phone: 314-298-8566 (Tel) 314-298-8757 (Fax)		Analysis Requested	Preservation Codes:								
Email: W/O #:			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amohlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAH K - EDTA W - pH 4.5 L - EDTA Z - other (specify)								
Project Name: Green Landfill		Project #:	49010431								
Site: Big Rivers CCR		SSCOW#:									
Sample Identification - Client ID (Lab ID)											
Sample ID	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix (W=Water, S=Soil, O=Material, B=Trace, A=All)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
River 01A 071218 (490-155625-1)	7/12/18	11:10	Eastern	Water	X	X	X	X	X	2	run once - upload data twice
River 01B 071218 (490-155625-2)	7/12/18	11:30	Eastern	Water	X	X	X	X	X	2	run once - upload data twice
River 02A 071218 (490-155625-3)	7/12/18	11:50	Eastern	Water	X	X	X	X	X	2	run once - upload data twice
River 02B 071218 (490-155625-4)	7/12/18	12:00	Eastern	Water	X	X	X	X	X	2	run once - upload data twice
River 03A 071218 (490-155625-5)	7/12/18	12:15	Eastern	Water	X	X	X	X	X	2	run once - upload data twice
River 03B 071218 (490-155625-6)	7/12/18	12:20	Eastern	Water	X	X	X	X	X	2	run once - upload data twice
River 04A 071218 (490-155625-7)	7/12/18	12:45	Eastern	Water	X	X	X	X	X	2	run once - upload data twice
River 04B 071218 (490-155625-8)	7/12/18	12:55	Eastern	Water	X	X	X	X	X	2	run once - upload data twice
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 Empty Kit Relinquished by: _____ Date: _____ Relinquished by: _____ Date/Time: _____ Company: _____ Relinquished by: _____ Date/Time: _____ Company: _____ Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: <i>18.5</i>						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/IOC Requirements: Method of Shipment: _____ Received by: _____ Date/Time: _____ Received by: _____ Date/Time: _____ Received by: _____ Date/Time: _____ Company: _____ Company: _____ Company: _____					

Login Sample Receipt Checklist

Client: Big Rivers Electric Corporation

Job Number: 490-155625-2

Login Number: 155625

List Number: 3

Creator: McBride, Mike

List Source: TestAmerica St. Louis

List Creation: 07/17/18 03:18 PM

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

Tracer/Carrier Summary

Client: Big Rivers Electric Corporation
 Project/Site: Green Landfill

TestAmerica Job ID: 490-155625-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	
490-155625-1	River 01A 071218	90.9	
490-155625-2	River 01B 071218	94.7	
490-155625-3	River 02A 071218	87.3	
490-155625-4	River 02B 071218	94.7	
490-155625-5	River 03A 071218	91.4	
490-155625-6	River 03B 071218	92.9	
490-155625-7	River 04A 071218	95.3	
490-155625-8	River 04B 071218	82.3	
600-169201-B-1-A DU	Duplicate	100	
LCS 160-376411/1-A	Lab Control Sample	97.9	
MB 160-376411/23-A	Method Blank	104	
Tracer/Carrier Legend			
Ba Carrier = Ba Carrier			

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
490-155625-1	River 01A 071218	90.9	90.1
490-155625-2	River 01B 071218	94.7	90.1
490-155625-3	River 02A 071218	87.3	90.1
490-155625-4	River 02B 071218	94.7	90.1
490-155625-5	River 03A 071218	91.4	90.8
490-155625-6	River 03B 071218	92.9	90.8
490-155625-7	River 04A 071218	95.3	86.7
490-155625-8	River 04B 071218	82.3	89.0
600-169201-B-1-B DU	Duplicate	100	92.7
LCS 160-376424/1-A	Lab Control Sample	97.9	93.8
MB 160-376424/23-A	Method Blank	104	89.0
Tracer/Carrier Legend			
Ba Carrier = Ba Carrier			
Y Carrier = Y Carrier			

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-155661-1
Client Project/Site: Sebree-Green Landfill
Revision: 3

For:
Big Rivers Electric Corporation
PO BOX 24
Henderson, Kentucky 42419

Attn: Greg Dick

Roxanne Cisneros

Authorized for release by:
9/6/2018 12:40:51 PM

Roxanne Cisneros, Senior Project Manager
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Results relate only to the items tested and the sample(s) as received by the laboratory.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



Table of Contents

Cover Page	1
Table of Contents	2
Sample Summary	3
Case Narrative	4
Definitions	6
Client Sample Results	7
QC Sample Results	19
QC Association	26
Chronicle	29
Method Summary	33
Certification Summary	34
Chain of Custody	36
Receipt Checklists	43
Tracer Carrier Summary	44

Sample Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-155661-1	River Seep-08-071318	Water	07/13/18 07:50	07/14/18 10:50
490-155661-2	River Seep-12-071318	Water	07/13/18 09:15	07/14/18 10:50
490-155661-3	River Seep-16-071318	Water	07/13/18 11:00	07/14/18 10:50
490-155661-4	River Seep-14-071318	Water	07/13/18 10:10	07/14/18 10:50
490-155661-5	River Seep-04-071218	Water	07/12/18 13:50	07/14/18 10:50
490-155661-6	River Seep-07-071218	Water	07/12/18 14:50	07/14/18 10:50
490-155661-7	River Seep-05-071218	Water	07/12/18 14:25	07/14/18 10:50

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Case Narrative

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Job ID: 490-155661-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative 490-155661-1

Comments

Revised Report 9/06/2018 to correct sample ID for River Seep-04-071218 (490-155661-5).

Revised Report 8/24/2018 to includes only the data for the River Seeps per client request.

Revised Report 8/10/2018 to add Potassium per client request.

Receipt

The samples were received on 7/14/2018 10:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.0° C, 3.1° C and 5.7° C.

HPLC/IC

Method(s) 9056A: The method blank for analytical batch 490-531256 contained Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method(s) 9056A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 490-531256 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 9056A: The method blank for analytical batch 490-531256 contained Fluoride and Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method(s) 9056A: The following samples were diluted due to the nature of the sample matrix: River Seep-08-071318 (490-155661-1), River Seep-14-071318 (490-155661-4), River Seep-04-071218 (490-155661-5), River Seep-07-071218 (490-155661-6), River Seep-05-071218 (490-155661-7), Elevated reporting limits (RLs) are provided.

Method(s) 9056A: The method blank as well as the continuing calibration blanks for analytical batch 490-531368 contained sulfate above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

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

Metals

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

General Chemistry

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

Organic Prep

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

Narrative

Job Narrative 490-155661-2

Comments

Revised Report 9/06/2018 to correct sample ID for River Seep-04-071218 (490-155661-5).

Revised Report 8/24/2018 to includes only the data for the River Seeps per client request.

Receipt

Case Narrative

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Job ID: 490-155661-1 (Continued)

Laboratory: TestAmerica Nashville (Continued)

The samples were received on 7/14/2018 10:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.0° C, 3.1° C and 5.7° C.

RAD

Method(s) 904.0: Ra-228 Prep Batch 160-376750: The following sample did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interferences (see prep NCM 160-144167). The sample was brown, opaque and contained heavy amounts of sediment. The data have been reported with this narrative. River Seep-05-071218 (490-155661-7)

Method(s) PrecSep_0: Radium 228 Prep Batch 160-376750:

Sample aliquot 490-155661-2 reduced due to potential matrix interference. Sample was yellow, murky, and contained heavy amounts of sediment.

Sample aliquots 490-155661-5 and 490-155661-7 reduced due to potential matrix interference. Samples were brown, opaque, and contained heavy amounts of sediment.

River Seep-12-071318 (490-155661-2), River Seep-04-071218 (490-155661-5), River Seep-05-071218 (490-155661-7)

Method(s) PrecSep_0: Radium 228 Prep Batch 160-376750: Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: River Seep-08-071318 (490-155661-1), River Seep-12-071318 (490-155661-2), River Seep-04-071218 (490-155661-5), River Seep-07-071218 (490-155661-6), and River Seep-05-071218 (490-155661-7). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep-21: Radium 226 Prep Batch 160-376745: Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: River Seep-08-071318 (490-155661-1), River Seep-12-071318 (490-155661-2), River Seep-04-071218 (490-155661-5), River Seep-07-071218 (490-155661-6), and River Seep-05-071218 (490-155661-7). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep-21: Radium 226 Prep Batch 160-376745:

Sample aliquot 490-155661-2 reduced due to potential matrix interference. Sample was yellow, murky, and contained heavy amounts of sediment.

Sample aliquots 490-155661-5 and 490-155661-7 reduced due to potential matrix interference. Samples were brown, opaque, and contained heavy amounts of sediment.

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

Definitions/Glossary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.

Glossary

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

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-08-071318

Lab Sample ID: 490-155661-1

Date Collected: 07/13/18 07:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2040		300	20.0	mg/L			07/25/18 21:00	100
Fluoride	0.0915	J	1.00	0.0100	mg/L			07/24/18 16:22	1
Sulfate	1440	B	250	1.50	mg/L			07/25/18 20:45	50

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	1.80		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:24	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00141	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 19:35	1
Arsenic	0.000404	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 19:35	1
Barium	0.0443	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 19:35	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 19:35	1
Boron	0.510	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 19:35	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 19:35	1
Calcium	801		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 19:35	1
Chromium	0.000560	J	0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 19:35	1
Cobalt	0.000691	J	0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 19:35	1
Lead	0.000769	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 19:35	1
Magnesium	291		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 19:35	1
Molybdenum	0.00296	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 19:35	1
Potassium	125		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 19:35	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 19:35	1
Sodium	274		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 19:35	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 19:35	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.16		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.8		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	174		10.0	5.00	mg/L			07/24/18 20:55	1
Total Dissolved Solids	5310		40.0	28.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.332		0.108	0.112	1.00	0.0893	pCi/L	07/19/18 15:20	08/10/18 16:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					07/19/18 15:20	08/10/18 16:41	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-08-071318

Lab Sample ID: 490-155661-1

Date Collected: 07/13/18 07:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.983		0.295	0.309	1.00	0.370	pCi/L	07/19/18 15:49	08/02/18 09:20	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					07/19/18 15:49	08/02/18 09:20	1
Y Carrier	90.5		40 - 110					07/19/18 15:49	08/02/18 09:20	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.31		0.314	0.329	5.00	0.370	pCi/L		08/21/18 03:20	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-12-071318

Lab Sample ID: 490-155661-2

Date Collected: 07/13/18 09:15

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	32.7		3.00	0.200	mg/L			07/24/18 16:37	1
Fluoride	0.0803	J	1.00	0.0100	mg/L			07/24/18 16:37	1
Sulfate	16.1	B	5.00	0.0300	mg/L			07/24/18 16:37	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:29	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000499	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 19:40	1
Arsenic	0.00467	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 19:40	1
Barium	0.0757	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 19:40	1
Beryllium	0.000145	J	0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 19:40	1
Boron	0.0379	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 19:40	1
Cadmium	0.000183	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 19:40	1
Calcium	21.1		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 19:40	1
Chromium	0.00200	J	0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 19:40	1
Cobalt	0.00581		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 19:40	1
Lead	0.00221	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 19:40	1
Magnesium	5.20		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 19:40	1
Molybdenum	0.000948	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 19:40	1
Potassium	2.37		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 19:40	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 19:40	1
Sodium	5.52		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 19:40	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 19:40	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.00		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	38.2		10.0	5.00	mg/L			07/24/18 21:02	1
Total Dissolved Solids	157		10.0	7.00	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.542		0.153	0.161	1.00	0.105	pCi/L	07/19/18 15:20	08/10/18 16:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110					07/19/18 15:20	08/10/18 16:41	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-12-071318

Lab Sample ID: 490-155661-2

Date Collected: 07/13/18 09:15

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.629		0.351	0.356	1.00	0.527	pCi/L	07/19/18 15:49	08/02/18 09:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110					07/19/18 15:49	08/02/18 09:21	1
Y Carrier	85.6		40 - 110					07/19/18 15:49	08/02/18 09:21	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.17		0.383	0.391	5.00	0.527	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-16-071318

Lab Sample ID: 490-155661-3

Date Collected: 07/13/18 11:00

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23.2		3.00	0.200	mg/L			07/24/18 16:52	1
Fluoride	0.177	J	1.00	0.0100	mg/L			07/24/18 16:52	1
Sulfate	26.5	B	5.00	0.0300	mg/L			07/24/18 16:52	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:35	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000270	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 19:44	1
Arsenic	0.0247		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 19:44	1
Barium	0.190	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 19:44	1
Beryllium	0.000211	J	0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 19:44	1
Boron	0.0321	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 19:44	1
Cadmium	0.000196	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 19:44	1
Calcium	93.8		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 19:44	1
Chromium	0.00383		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 19:44	1
Cobalt	0.00613		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 19:44	1
Lead	0.00521		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 19:44	1
Magnesium	20.3		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 19:44	1
Molybdenum	0.00878	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 19:44	1
Potassium	4.85		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 19:44	1
Selenium	0.000906	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 19:44	1
Sodium	26.7		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 19:44	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 19:44	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.40		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	393		10.0	5.00	mg/L			07/24/18 21:09	1
Total Dissolved Solids	504		20.0	14.0	mg/L			07/18/18 08:50	1

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-14-071318

Lab Sample ID: 490-155661-4

Date Collected: 07/13/18 10:10

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	22.7		3.00	0.200	mg/L			07/24/18 17:07	1
Fluoride	0.144	J	1.00	0.0100	mg/L			07/24/18 17:07	1
Sulfate	159	B	50.0	0.300	mg/L			07/25/18 21:15	10

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0126	J	0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:50	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000312	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 19:49	1
Arsenic	0.0173		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 19:49	1
Barium	0.242		0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 19:49	1
Beryllium	0.000497	J	0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 19:49	1
Boron	0.0694	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 19:49	1
Cadmium	0.000312	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 19:49	1
Calcium	171		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 19:49	1
Chromium	0.00969		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 19:49	1
Cobalt	0.0125		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 19:49	1
Lead	0.0109		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 19:49	1
Magnesium	36.6		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 19:49	1
Molybdenum	0.00550	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 19:49	1
Potassium	4.96		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 19:49	1
Selenium	0.000582	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 19:49	1
Sodium	18.5		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 19:49	1
Thallium	0.000126	J	0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 19:49	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.14		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.8		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	443		10.0	5.00	mg/L			07/24/18 21:17	1
Total Dissolved Solids	790		20.0	14.0	mg/L			07/18/18 08:50	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-04-071218

Lab Sample ID: 490-155661-5

Date Collected: 07/12/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	189		30.0	2.00	mg/L			07/25/18 21:59	10
Fluoride	0.239	J F1	1.00	0.0100	mg/L			07/24/18 17:51	1
Sulfate	1310	B	250	1.50	mg/L			07/25/18 22:14	50

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0209	J	0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:56	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000200	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:06	1
Arsenic	0.00188	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:06	1
Barium	0.0384	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:06	1
Beryllium	0.00372		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:06	1
Boron	2.19		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:06	1
Cadmium	0.00307		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:06	1
Calcium	460		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:06	1
Chromium	0.00386		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:06	1
Cobalt	0.0447		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:06	1
Lead	0.00507		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:06	1
Magnesium	63.6		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:06	1
Molybdenum	ND		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:06	1
Potassium	9.51		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 20:06	1
Selenium	0.00216	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:06	1
Sodium	42.1		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:06	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:06	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.26		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	ND		10.0	5.00	mg/L			07/24/18 21:21	1
Total Dissolved Solids	2130		20.0	14.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.665		0.213	0.221	1.00	0.167	pCi/L	07/19/18 15:20	08/10/18 16:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.4		40 - 110					07/19/18 15:20	08/10/18 16:40	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-04-071218

Lab Sample ID: 490-155661-5

Date Collected: 07/12/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.810		0.520	0.525	1.00	0.796	pCi/L	07/19/18 15:49	08/02/18 09:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.4		40 - 110					07/19/18 15:49	08/02/18 09:22	1
Y Carrier	87.1		40 - 110					07/19/18 15:49	08/02/18 09:22	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.48		0.562	0.570	5.00	0.796	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-07-071218

Lab Sample ID: 490-155661-6

Date Collected: 07/12/18 14:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1990		300	20.0	mg/L			07/25/18 22:29	100
Fluoride	0.102	J	1.00	0.0100	mg/L			07/24/18 18:21	1
Sulfate	1480	B	500	3.00	mg/L			07/25/18 22:29	100

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.772		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:01	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:11	1
Arsenic	0.00182	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:11	1
Barium	0.0605	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:11	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:11	1
Boron	1.46		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:11	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:11	1
Calcium	1120		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:11	1
Chromium	0.000340	J	0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:11	1
Cobalt	0.0218		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:11	1
Lead	0.000523	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:11	1
Magnesium	51.8		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:11	1
Molybdenum	0.00219	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:11	1
Potassium	262		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 20:11	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:11	1
Sodium	277		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:11	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:11	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.01		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	87.7		10.0	5.00	mg/L			07/24/18 21:28	1
Total Dissolved Solids	6080		40.0	28.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.566		0.144	0.152	1.00	0.0969	pCi/L	07/19/18 15:20	08/10/18 16:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.4		40 - 110					07/19/18 15:20	08/10/18 16:39	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-07-071218

Lab Sample ID: 490-155661-6

Date Collected: 07/12/18 14:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.831		0.318	0.327	1.00	0.434	pCi/L	07/19/18 15:49	08/02/18 09:22	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	79.4		40 - 110					07/19/18 15:49	08/02/18 09:22	1
Y Carrier	87.1		40 - 110					07/19/18 15:49	08/02/18 09:22	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.40		0.349	0.361	5.00	0.434	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-05-071218

Lab Sample ID: 490-155661-7

Date Collected: 07/12/18 14:25

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1670		300	20.0	mg/L			07/25/18 22:44	100
Fluoride	0.0795	J	1.00	0.0100	mg/L			07/24/18 18:36	1
Sulfate	1170	B	500	3.00	mg/L			07/25/18 22:44	100

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.340		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:07	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000366	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:16	1
Arsenic	0.0192		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:16	1
Barium	0.718		0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:16	1
Beryllium	0.000545	J	0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:16	1
Boron	0.853	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:16	1
Cadmium	0.000563	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:16	1
Calcium	916		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:16	1
Chromium	0.0124		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:16	1
Cobalt	0.0327		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:16	1
Lead	0.0104		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:16	1
Magnesium	77.8		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:16	1
Molybdenum	0.00442	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:16	1
Potassium	238		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 20:16	1
Selenium	0.00121	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:16	1
Sodium	285		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:16	1
Thallium	0.000164	J	0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:16	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.95		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	229		10.0	5.00	mg/L			07/24/18 21:41	1
Total Dissolved Solids	5140		40.0	28.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.81		0.503	0.609	1.00	0.187	pCi/L	07/19/18 15:20	08/10/18 16:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.9		40 - 110					07/19/18 15:20	08/10/18 16:40	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-05-071218

Lab Sample ID: 490-155661-7

Date Collected: 07/12/18 14:25

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	3.83	G	0.871	0.940	1.00	1.07	pCi/L	07/19/18 15:49	08/02/18 09:22	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	82.9		40 - 110					07/19/18 15:49	08/02/18 09:22	1
Y Carrier	83.0		40 - 110					07/19/18 15:49	08/02/18 09:22	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	7.64		1.01	1.12	5.00	1.07	pCi/L		08/21/18 03:20	1



QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 490-531256/3
Matrix: Water
Analysis Batch: 531256

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	0.200	mg/L			07/24/18 13:54	1
Fluoride	ND		1.00	0.0100	mg/L			07/24/18 13:54	1
Sulfate	0.3643	J	5.00	0.0300	mg/L			07/24/18 13:54	1

Lab Sample ID: LCS 490-531256/4
Matrix: Water
Analysis Batch: 531256

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.350		mg/L		93	80 - 120
Fluoride	1.00	0.9781	J	mg/L		98	80 - 120
Sulfate	10.0	9.696		mg/L		97	80 - 120

Lab Sample ID: LCSD 490-531256/5
Matrix: Water
Analysis Batch: 531256

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.374		mg/L		94	80 - 120	0	20
Fluoride	1.00	0.9558	J	mg/L		95	80 - 120	2	20
Sulfate	10.0	9.589		mg/L		96	80 - 120	1	20

Lab Sample ID: 490-155661-5 MS
Matrix: Water
Analysis Batch: 531256

Client Sample ID: River Seep-04-071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	0.239	J F1	1.00	1.702	F1	mg/L		146	80 - 120

Lab Sample ID: MB 490-531368/3
Matrix: Water
Analysis Batch: 531368

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	0.200	mg/L			07/25/18 18:18	1
Fluoride	ND		1.00	0.0100	mg/L			07/25/18 18:18	1
Sulfate	0.3720	J	5.00	0.0300	mg/L			07/25/18 18:18	1

Lab Sample ID: MB 490-531368/30
Matrix: Water
Analysis Batch: 531368

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	0.200	mg/L			07/26/18 00:57	1
Fluoride	ND		1.00	0.0100	mg/L			07/26/18 00:57	1
Sulfate	0.3740	J	5.00	0.0300	mg/L			07/26/18 00:57	1

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-531368/31
Matrix: Water
Analysis Batch: 531368

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.348		mg/L		93	80 - 120
Fluoride	1.00	0.9475	J	mg/L		95	80 - 120
Sulfate	10.0	9.314		mg/L		93	80 - 120

Lab Sample ID: LCS 490-531368/4
Matrix: Water
Analysis Batch: 531368

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.348		mg/L		93	80 - 120
Fluoride	1.00	0.9854	J	mg/L		98	80 - 120
Sulfate	10.0	9.495		mg/L		95	80 - 120

Lab Sample ID: LCSD 490-531368/32
Matrix: Water
Analysis Batch: 531368

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.368		mg/L		94	80 - 120	0	20
Fluoride	1.00	0.9513	J	mg/L		95	80 - 120	0	20
Sulfate	10.0	9.447		mg/L		94	80 - 120	1	20

Lab Sample ID: LCSD 490-531368/5
Matrix: Water
Analysis Batch: 531368

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.296		mg/L		93	80 - 120	1	20
Fluoride	1.00	0.9931	J	mg/L		99	80 - 120	1	20
Sulfate	10.0	9.710		mg/L		97	80 - 120	2	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 180-250902/1-A
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 250902

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 16:47	1

Lab Sample ID: LCS 180-250902/2-A
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250902

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	1.00	1.028		mg/L		103	80 - 120

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 490-155660-A-5-B MS
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 250902

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.0132	J	1.00	1.082		mg/L		107	75 - 125

Lab Sample ID: 490-155660-A-5-C MSD
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 250902

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.0132	J	1.00	1.090		mg/L		108	75 - 125	1	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-250903/1-A
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 18:53	1
Arsenic	ND		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 18:53	1
Barium	ND		0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 18:53	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 18:53	1
Boron	ND		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 18:53	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 18:53	1
Calcium	ND		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 18:53	1
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 18:53	1
Cobalt	ND		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 18:53	1
Lead	ND		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 18:53	1
Magnesium	ND		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 18:53	1
Molybdenum	ND		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 18:53	1
Potassium	ND		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 18:53	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 18:53	1
Sodium	ND		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 18:53	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 18:53	1

Lab Sample ID: LCS 180-250903/2-A
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.500	0.4729		mg/L		95	80 - 120
Arsenic	0.0400	0.03658		mg/L		91	80 - 120
Barium	2.00	1.840		mg/L		92	80 - 120
Beryllium	0.0500	0.05027		mg/L		101	80 - 120
Boron	1.00	0.8897	J	mg/L		89	80 - 120
Cadmium	0.0500	0.05029		mg/L		101	80 - 120
Calcium	50.0	45.70		mg/L		91	80 - 120
Chromium	0.200	0.1649		mg/L		82	80 - 120
Cobalt	0.500	0.4321		mg/L		86	80 - 120
Lead	0.0200	0.01998		mg/L		100	80 - 120

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

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

Lab Sample ID: LCS 180-250903/2-A
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Magnesium	50.0	45.74		mg/L		91	80 - 120
Molybdenum	1.00	0.9327		mg/L		93	80 - 120
Potassium	50.0	46.09		mg/L		92	80 - 120
Selenium	0.0100	0.009085	J	mg/L		91	80 - 120
Sodium	50.0	44.98		mg/L		90	80 - 120
Thallium	0.0500	0.04846		mg/L		97	80 - 120

Lab Sample ID: 490-155660-A-6-C MS
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.500	0.4679		mg/L		94	75 - 125
Arsenic	ND		0.0400	0.03692		mg/L		92	75 - 125
Barium	ND		2.00	1.839		mg/L		92	75 - 125
Beryllium	ND		0.0500	0.04768		mg/L		95	75 - 125
Boron	0.00422	J	1.00	0.8456	J	mg/L		84	75 - 125
Cadmium	ND		0.0500	0.04723		mg/L		94	75 - 125
Calcium	ND		50.0	45.39		mg/L		91	75 - 125
Chromium	ND		0.200	0.1840		mg/L		92	75 - 125
Cobalt	ND		0.500	0.4386		mg/L		88	75 - 125
Lead	0.000399	J	0.0200	0.01986		mg/L		97	75 - 125
Magnesium	0.0156	J	50.0	46.32		mg/L		93	75 - 125
Molybdenum	ND		1.00	0.9262		mg/L		93	75 - 125
Potassium	0.0680	J	50.0	46.15		mg/L		92	75 - 125
Selenium	ND		0.0100	0.01006		mg/L		101	75 - 125
Sodium	ND		50.0	45.34		mg/L		91	75 - 125
Thallium	ND		0.0500	0.04726		mg/L		95	75 - 125

Lab Sample ID: 490-155660-A-6-D MSD
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.500	0.4680		mg/L		94	75 - 125	0	20
Arsenic	ND		0.0400	0.03704		mg/L		93	75 - 125	0	20
Barium	ND		2.00	1.847		mg/L		92	75 - 125	0	20
Beryllium	ND		0.0500	0.04801		mg/L		96	75 - 125	1	20
Boron	0.00422	J	1.00	0.8557	J	mg/L		85	75 - 125	1	20
Cadmium	ND		0.0500	0.04852		mg/L		97	75 - 125	3	20
Calcium	ND		50.0	44.91		mg/L		90	75 - 125	1	20
Chromium	ND		0.200	0.1875		mg/L		94	75 - 125	2	20
Cobalt	ND		0.500	0.4400		mg/L		88	75 - 125	0	20
Lead	0.000399	J	0.0200	0.01961		mg/L		96	75 - 125	1	20
Magnesium	0.0156	J	50.0	45.89		mg/L		92	75 - 125	1	20
Molybdenum	ND		1.00	0.9301		mg/L		93	75 - 125	0	20
Potassium	0.0680	J	50.0	45.93		mg/L		92	75 - 125	0	20
Selenium	ND		0.0100	0.01030		mg/L		103	75 - 125	2	20
Sodium	ND		50.0	45.17		mg/L		90	75 - 125	0	20

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

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

Lab Sample ID: 490-155660-A-6-D MSD
 Matrix: Water
 Analysis Batch: 252059

Client Sample ID: Matrix Spike Duplicate
 Prep Type: Total Recoverable
 Prep Batch: 250903

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Thallium	ND		0.0500	0.04752		mg/L		95	75 - 125	1	20

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-250943/1-A
 Matrix: Water
 Analysis Batch: 251171

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 250943

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 10:52	1

Lab Sample ID: LCS 180-250943/2-A
 Matrix: Water
 Analysis Batch: 251171

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 250943

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.486		ug/L		99	80 - 120

Lab Sample ID: 180-79800-G-1-E MS
 Matrix: Water
 Analysis Batch: 251171

Client Sample ID: Matrix Spike
 Prep Type: Total/NA
 Prep Batch: 250943

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		1.00	0.9270		ug/L		93	75 - 125

Lab Sample ID: 180-79800-G-1-F MSD
 Matrix: Water
 Analysis Batch: 251171

Client Sample ID: Matrix Spike Duplicate
 Prep Type: Total/NA
 Prep Batch: 250943

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		1.00	0.9210		ug/L		92	75 - 125	1	20

Method: 9040C - pH

Lab Sample ID: LCS 490-531203/1
 Matrix: Water
 Analysis Batch: 531203

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.000		SU		100	98 - 103

Lab Sample ID: 490-155660-D-5 DU
 Matrix: Water
 Analysis Batch: 531203

Client Sample ID: Duplicate
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	8.11		8.110		SU		0	20
Temperature	21.7		21.70		Degrees C		0	20

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 9040C - pH (Continued)

Lab Sample ID: LCS 490-531204/1
Matrix: Water
Analysis Batch: 531204

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.000		SU		100	98 - 103

Lab Sample ID: 490-155661-9 DU
Matrix: Water
Analysis Batch: 531204

Client Sample ID: Landfill Seep-01-071318-DUP
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	10.0		10.03		SU		0	20
Temperature	21.9		21.90		Degrees C		0	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-531384/73
Matrix: Water
Analysis Batch: 531384

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		10.0	5.00	mg/L			07/24/18 20:09	1

Lab Sample ID: LCS 490-531384/74
Matrix: Water
Analysis Batch: 531384

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	95.45		mg/L		95	90 - 110

Lab Sample ID: LCSD 490-531384/95
Matrix: Water
Analysis Batch: 531384

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	100	95.67		mg/L		96	90 - 110	0	20

Lab Sample ID: 490-155661-6 DU
Matrix: Water
Analysis Batch: 531384

Client Sample ID: River Seep-07-071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	87.7		88.85		mg/L		1	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 490-529395/1
Matrix: Water
Analysis Batch: 529395

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10.0	7.00	mg/L			07/18/18 08:50	1

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 490-529395/2
Matrix: Water
Analysis Batch: 529395

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	100	103.0		mg/L		103	90 - 110

Lab Sample ID: 490-155661-5 DU
Matrix: Water
Analysis Batch: 529395

Client Sample ID: River Seep-04-071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	2130		2194		mg/L		3	20

Lab Sample ID: 490-155661-13 DU
Matrix: Water
Analysis Batch: 529395

Client Sample ID: Landfill Seep-04-071318
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	10100		10080		mg/L		0.1	20

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

HPLC/IC

Analysis Batch: 531256

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	9056A	
490-155661-2	River Seep-12-071318	Total/NA	Water	9056A	
490-155661-3	River Seep-16-071318	Total/NA	Water	9056A	
490-155661-4	River Seep-14-071318	Total/NA	Water	9056A	
490-155661-5	River Seep-04-071218	Total/NA	Water	9056A	
490-155661-6	River Seep-07-071218	Total/NA	Water	9056A	
490-155661-7	River Seep-05-071218	Total/NA	Water	9056A	

Analysis Batch: 531368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	9056A	
490-155661-1	River Seep-08-071318	Total/NA	Water	9056A	
490-155661-4	River Seep-14-071318	Total/NA	Water	9056A	
490-155661-5	River Seep-04-071218	Total/NA	Water	9056A	
490-155661-5	River Seep-04-071218	Total/NA	Water	9056A	
490-155661-6	River Seep-07-071218	Total/NA	Water	9056A	
490-155661-7	River Seep-05-071218	Total/NA	Water	9056A	

Metals

Prep Batch: 250902

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total Recoverable	Water	3005A	
490-155661-2	River Seep-12-071318	Total Recoverable	Water	3005A	
490-155661-3	River Seep-16-071318	Total Recoverable	Water	3005A	
490-155661-4	River Seep-14-071318	Total Recoverable	Water	3005A	
490-155661-5	River Seep-04-071218	Total Recoverable	Water	3005A	
490-155661-6	River Seep-07-071218	Total Recoverable	Water	3005A	
490-155661-7	River Seep-05-071218	Total Recoverable	Water	3005A	

Prep Batch: 250903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total Recoverable	Water	3005A	
490-155661-2	River Seep-12-071318	Total Recoverable	Water	3005A	
490-155661-3	River Seep-16-071318	Total Recoverable	Water	3005A	
490-155661-4	River Seep-14-071318	Total Recoverable	Water	3005A	
490-155661-5	River Seep-04-071218	Total Recoverable	Water	3005A	
490-155661-6	River Seep-07-071218	Total Recoverable	Water	3005A	
490-155661-7	River Seep-05-071218	Total Recoverable	Water	3005A	

Prep Batch: 250943

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	7470A	
490-155661-2	River Seep-12-071318	Total/NA	Water	7470A	
490-155661-3	River Seep-16-071318	Total/NA	Water	7470A	
490-155661-4	River Seep-14-071318	Total/NA	Water	7470A	
490-155661-5	River Seep-04-071218	Total/NA	Water	7470A	
490-155661-6	River Seep-07-071218	Total/NA	Water	7470A	
490-155661-7	River Seep-05-071218	Total/NA	Water	7470A	

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Metals (Continued)

Analysis Batch: 251171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	EPA 7470A	250943
490-155661-2	River Seep-12-071318	Total/NA	Water	EPA 7470A	250943
490-155661-3	River Seep-16-071318	Total/NA	Water	EPA 7470A	250943
490-155661-4	River Seep-14-071318	Total/NA	Water	EPA 7470A	250943
490-155661-5	River Seep-04-071218	Total/NA	Water	EPA 7470A	250943
490-155661-6	River Seep-07-071218	Total/NA	Water	EPA 7470A	250943
490-155661-7	River Seep-05-071218	Total/NA	Water	EPA 7470A	250943

Analysis Batch: 251527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total Recoverable	Water	6010C	250902
490-155661-2	River Seep-12-071318	Total Recoverable	Water	6010C	250902
490-155661-3	River Seep-16-071318	Total Recoverable	Water	6010C	250902
490-155661-4	River Seep-14-071318	Total Recoverable	Water	6010C	250902
490-155661-5	River Seep-04-071218	Total Recoverable	Water	6010C	250902
490-155661-6	River Seep-07-071218	Total Recoverable	Water	6010C	250902
490-155661-7	River Seep-05-071218	Total Recoverable	Water	6010C	250902

Analysis Batch: 252059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total Recoverable	Water	6020A	250903
490-155661-2	River Seep-12-071318	Total Recoverable	Water	6020A	250903
490-155661-3	River Seep-16-071318	Total Recoverable	Water	6020A	250903
490-155661-4	River Seep-14-071318	Total Recoverable	Water	6020A	250903
490-155661-5	River Seep-04-071218	Total Recoverable	Water	6020A	250903
490-155661-6	River Seep-07-071218	Total Recoverable	Water	6020A	250903
490-155661-7	River Seep-05-071218	Total Recoverable	Water	6020A	250903

General Chemistry

Analysis Batch: 529395

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	SM 2540C	
490-155661-2	River Seep-12-071318	Total/NA	Water	SM 2540C	
490-155661-3	River Seep-16-071318	Total/NA	Water	SM 2540C	
490-155661-4	River Seep-14-071318	Total/NA	Water	SM 2540C	
490-155661-5	River Seep-04-071218	Total/NA	Water	SM 2540C	
490-155661-6	River Seep-07-071218	Total/NA	Water	SM 2540C	
490-155661-7	River Seep-05-071218	Total/NA	Water	SM 2540C	

Analysis Batch: 531203

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	9040C	
490-155661-2	River Seep-12-071318	Total/NA	Water	9040C	
490-155661-3	River Seep-16-071318	Total/NA	Water	9040C	
490-155661-4	River Seep-14-071318	Total/NA	Water	9040C	
490-155661-5	River Seep-04-071218	Total/NA	Water	9040C	
490-155661-6	River Seep-07-071218	Total/NA	Water	9040C	
490-155661-7	River Seep-05-071218	Total/NA	Water	9040C	

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

General Chemistry (Continued)

Analysis Batch: 531384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	SM 2320B	
490-155661-2	River Seep-12-071318	Total/NA	Water	SM 2320B	
490-155661-3	River Seep-16-071318	Total/NA	Water	SM 2320B	
490-155661-4	River Seep-14-071318	Total/NA	Water	SM 2320B	
490-155661-5	River Seep-04-071218	Total/NA	Water	SM 2320B	
490-155661-6	River Seep-07-071218	Total/NA	Water	SM 2320B	
490-155661-7	River Seep-05-071218	Total/NA	Water	SM 2320B	

Rad

Prep Batch: 376745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	PrecSep-21	
490-155661-2	River Seep-12-071318	Total/NA	Water	PrecSep-21	
490-155661-5	River Seep-04-071218	Total/NA	Water	PrecSep-21	
490-155661-6	River Seep-07-071218	Total/NA	Water	PrecSep-21	
490-155661-7	River Seep-05-071218	Total/NA	Water	PrecSep-21	

Prep Batch: 376750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	PrecSep_0	
490-155661-2	River Seep-12-071318	Total/NA	Water	PrecSep_0	
490-155661-5	River Seep-04-071218	Total/NA	Water	PrecSep_0	
490-155661-6	River Seep-07-071218	Total/NA	Water	PrecSep_0	
490-155661-7	River Seep-05-071218	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-08-071318

Lab Sample ID: 490-155661-1

Date Collected: 07/13/18 07:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 16:22	SW1	TAL NSH
Total/NA	Analysis	9056A		50			531368	07/25/18 20:45	JHS	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/25/18 21:00	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:24	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 19:35	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:04	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 20:55	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			999.94 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381568	08/10/18 16:41	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.94 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379945	08/02/18 09:20	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: River Seep-12-071318

Lab Sample ID: 490-155661-2

Date Collected: 07/13/18 09:15

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 16:37	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:29	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 19:40	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:05	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:02	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			750.37 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381568	08/10/18 16:41	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.37 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:21	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-16-071318

Lab Sample ID: 490-155661-3

Date Collected: 07/13/18 11:00

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 16:52	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:35	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 19:44	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:06	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:09	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH

Client Sample ID: River Seep-14-071318

Lab Sample ID: 490-155661-4

Date Collected: 07/13/18 10:10

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 17:07	SW1	TAL NSH
Total/NA	Analysis	9056A		10			531368	07/25/18 21:15	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:50	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 19:49	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:07	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:17	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH

Client Sample ID: River Seep-04-071218

Lab Sample ID: 490-155661-5

Date Collected: 07/12/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 17:51	SW1	TAL NSH
Total/NA	Analysis	9056A		10			531368	07/25/18 21:59	JHS	TAL NSH
Total/NA	Analysis	9056A		50			531368	07/25/18 22:14	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:56	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:06	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:08	RJR	TAL PIT

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-04-071218

Lab Sample ID: 490-155661-5

Date Collected: 07/12/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:21	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			500.17 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381569	08/10/18 16:40	RTM	TAL SL
Total/NA	Prep	PrecSep_0			500.17 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:22	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: River Seep-07-071218

Lab Sample ID: 490-155661-6

Date Collected: 07/12/18 14:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 18:21	SW1	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/25/18 22:29	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:01	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:11	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:09	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:28	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			999.84 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381569	08/10/18 16:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.84 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:22	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: River Seep-05-071218

Lab Sample ID: 490-155661-7

Date Collected: 07/12/18 14:25

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 18:36	SW1	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/25/18 22:44	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:07	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:16	WTR	TAL PIT

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-05-071218

Lab Sample ID: 490-155661-7

Date Collected: 07/12/18 14:25

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:12	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:41	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			499.95 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381569	08/10/18 16:40	RTM	TAL SL
Total/NA	Prep	PrecSep_0			499.95 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:22	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177
 TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Method Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL NSH
6010C	Metals (ICP)	SW846	TAL PIT
6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
9040C	pH	SW846	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL NSH
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT

Protocol References:

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

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

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Accreditation/Certification Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Laboratory: TestAmerica Nashville

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kentucky (UST)	State Program	4	19	06-30-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9040C		Water	pH
9040C		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate
SM 2320B		Water	Alkalinity
SM 2540C		Water	Total Dissolved Solids

Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-19
California	State Program	9	2891	04-30-19
Connecticut	State Program	1	PH-0688	09-30-18
Florida	NELAP	4	E871008	06-30-19
Illinois	NELAP	5	200005	06-30-19
Kansas	NELAP	7	E-10350	01-31-19
Louisiana	NELAP	6	04041	06-30-19
Nevada	State Program	9	PA00164	07-31-19
New Hampshire	NELAP	1	2030	04-04-19
New Jersey	NELAP	2	PA005	06-30-19
New York	NELAP	2	11182	03-31-19
North Carolina (WW/SW)	State Program	4	434	12-31-18
Oregon	NELAP	10	PA-2151	01-28-19
Pennsylvania	NELAP	3	02-00416	04-30-19
South Carolina	State Program	4	89014	04-30-19
Texas	NELAP	6	T104704528-15-2	03-31-19
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-19
Virginia	NELAP	3	460189	09-14-18 *
West Virginia DEP	State Program	3	142	01-31-19
Wisconsin	State Program	5	998027800	08-31-18 *

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Nashville

Accreditation/Certification Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

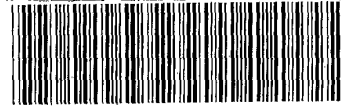
Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18 *
West Virginia DEP	State Program	3	381	10-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

COOLER RECEIPT FORM



490-155661 Chain of Custody

Cooler Received/Opened On 7/14/2018 @ 1050

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

- 1. Tracking # 2692 (last 4 digits, FedEx) Courier: FedEx
IR Gun ID 17960357 pH Strip Lot NA Chlorine Strip Lot NA
- 2. Temperature of rep. sample or temp blank when opened: 5.9 Degrees Celsius
- 3. If item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA
- 4. Were custody seals on outside of cooler? YES NO...NA
If yes, how many and where: 1 Front

- 5. Were the seals intact, signed, and dated correctly? YES...NO...NA
- 6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) GH

- 7. Were custody seals on containers: YES NO and intact YES...NO NA
Were these signed and dated correctly? YES...NO...NA NA
- 8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
- 9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None
- 10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
- 11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA
- 12. Did all container labels and tags agree with custody papers? YES...NO...NA
- 13a. Were VOA vials received? YES NO...NA
- b. Was there any observable headspace present in any VOA vial? YES...NO...NA NA



- 14. Was there a Trip Blank in this cooler? YES NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) ADH

- 15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO NA
- b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA NA
- 16. Was residual chlorine present? YES...NO NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) ADH

- 17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA
- 18. Did you sign the custody papers in the appropriate place? YES...NO...NA
- 19. Were correct containers used for the analysis requested? YES...NO...NA
- 20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) ADH

I certify that I attached a label with the unique LIMS number to each container (initial) ADH

- 21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO...# _____



COOLER RECEIPT FORM

Cooler Received/Opened On 7/14/2018 @ 10:50

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 2681 (last 4 digits, FedEx) Courier: FedEx
 IR Gun ID 17960353 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 1.0 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA YES

If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA YES

6. Were custody papers inside cooler? YES...NO...NA YES

I certify that I opened the cooler and answered questions 1-6 (initial) KOF

7. Were custody seals on containers: YES NO and intact YES...NO...NA NA

Were these signed and dated correctly? YES...NO...NA NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA YES

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA YES

12. Did all container labels and tags agree with custody papers? YES...NO...NA YES

13a. Were VOA vials received? YES...NO...NA NO

b. Was there any observable headspace present in any VOA vial? YES...NO...NA NA



14. Was there a Trip Blank in this cooler? YES...NO...NA NO If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) KOF

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA NA

b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA YES

16. Was residual chlorine present? YES...NO...NA NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) KOF

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA YES

18. Did you sign the custody papers in the appropriate place? YES...NO...NA YES

19. Were correct containers used for the analysis requested? YES...NO...NA YES

20. Was sufficient amount of sample sent in each container? YES...NO...NA YES

I certify that I entered this project into LIMS and answered questions 17-20 (initial) KOF

I certify that I attached a label with the unique LIMS number to each container (initial) KOF

21. Were there Non-Conformance issues at login? YES...NO...NA NO Was a NCM generated? YES...NO...NA NO # _____

Loc: 490
155661

COOLER RECEIPT FORM

Cooler Received/Opened On 7/14/2018 @1050

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 2670 (last 4 digits, FedEx) Courier: FedEx
 IR Gun ID 14740456 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 3.1 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 From

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) AS

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



14. Was there a Trip Blank in this cooler? YES NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) AS

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) AS

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) AS

I certify that I attached a label with the unique LIMS number to each container (initial) AS

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES...NO...# _____

BIS = Broken in shipment
 Cooler Receipt Form.doc

TestAmerica Nashville
 2960 Foster Creighton Drive
 Nashville, TN 37204
 Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information
 Client Contact: **Chris Davis**
 Phone: **513-237-1854**
 Company: **Big Rivers Electric Corporation**
 Address: **PO BOX 24**
 City: **Henderson**
 State, Zip: **KY, 42419**
 Phone: **270-844-6010(Tel)**
 Email: **Gregory.Dick@bigrivers.com**
 Project Name: **Big Rivers Electric Corp - Henderson KY**
 Site: **Setree Green Landfill**

Lab Fill: **Cisneros, Roxanne**
 E-Mail: **roxanne.cisneros@testamericainc.com**
 Sample: **Chris Davis**
 Phone: **513-237-1854**
 Carrying Ticketing No(s): **Perplex 32605**

Due Date Requested: **Standard**
 TAT Requested (days): **Standard**
 PO #: **270-844-6010(Tel)**
 Purchase Order - see DOCS
 WO #: **Gregory.Dick@bigrivers.com**

Analysis Requested
 L'oc: 490
 155661
 220B, 9040-9066, ORGFM_28D
 6010A, 6020A
 2640C, Calcd - TDS
 Redun 226/228

Preservation Codes:
 A - HCL
 B - NaOH
 C - Zn Acetate
 D - Nitric Acid
 E - NaHSO4
 F - MeOH
 G - Amchlor
 H - Ascorbic Acid
 I - Ice
 J - DI Water
 K - EDTA
 L - EDA
 Other: **CCC App III, IV + AIC, N, M, N2**

Special Instructions/Note:
 pH 7.09
 7.37
 7.46
 7.54
 5.13
 7.27
 6.92
 10.64
 10.64
 10.20
 9.02

Sample Identification
 Sample Date: 7/13/18
 Sample Time: 0750
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Date: 7/13/18
 Sample Time: 0915
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Date: 7/13/18
 Sample Time: 1100
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Date: 7/13/18
 Sample Time: 1010
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Date: 7/13/18
 Sample Time: 1350
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Date: 7/12/18
 Sample Time: 1425
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Date: 7/13/18
 Sample Time: 1320
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Date: 7/13/18
 Sample Time: 1300
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Date: 7/13/18
 Sample Time: 1330
 Sample Type (C=Comp, G=grab): **G**
 Matrix (W=water, S=solid, O=soil, B=biomass, T=tissue, A=air): **Water**
 Preservation Code: **6**

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client
 Disposal By Lab
 Archive For: _____ Months

Special Instructions/QC Requirements:
 Non-Hazard
 Flammable
 Skin Irritant
 Poison B
 Unknown
 Radiological
 Deliverable Requested: I, II, III, IV, Other (specify)

Empty Kit Relinquished by: _____
 Relinquished by: _____
 Relinquished by: _____
 Relinquished by: _____

Received by: _____
 Received by: _____
 Received by: _____
 Received by: _____

Date/Time: 7/13/18 1630
 Date/Time: 7/14/18 1050
 Date/Time: 5.7.18.0.3.1

Company: **AECOM**
 Company: **AECOM**
 Company: _____
 Company: _____

Custody Seal No.: _____
 Custody Seal No.: _____
 Custody Seal No.: _____
 Custody Seal No.: _____

Cooler Temperature(s) °C and Other Remarks:
 Cooler Temperature(s) °C and Other Remarks:
 Cooler Temperature(s) °C and Other Remarks:
 Cooler Temperature(s) °C and Other Remarks:



TestAmerica Nashville
 2960 Foster Creighton Drive
 Nashville, TN 37204
 Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information Client Contact: Greg Dick Company: Big Rivers Electric Corporation Address: PO BOX 24 City: Henderson State, Zip: KY, 42419 Phone: 270-844-6010(Tel) Email: Gregory.Dick@bigrivers.com Project Name: Big Rivers Electric Corp - Henderson KY Site: <u>Sabree Green Landfill</u>		Lab PIV: Cisneros, Roxanne E-Mail: roxanne.cisneros@testamericainc.com Carner Tracking No(s): <u>760X</u> <u>300015</u>		COC No: 490-86693-251731 Page: Page 1 of 2 Job #:	
Due Date Requested: <u>Standard</u> TAT Requested (days): <u>Standard</u> PO #: <u>Purchase Order - see DOCs</u> WO #:		Analysis Requested Total Number of Containers: <u>1</u> Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - As/NdO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSF Todecalhydrate I - Ice U - Ace. 'e' J - DI Water V - MCA K - EDTA W - PH 4-5 L - EDA Z - other (specify) Other:			
Sample Date: <u>7/13/18</u> Sample Time: <u>1350</u> Sample Type (C=Comp, G=grab): <u>6</u> Preservation Code: <u>6</u> Matrix (W=Water, S=solid, O=on-site, BT=Trace, A=Air)		Special Instructions/Note: <u>CCR App II, IV +</u> <u>Alk, No, Mg</u> <u>PH 7.95</u> <u>at 10.71</u> Loc: 490 155661			
Sample Identification <u>POND -018 - 071318</u> <u>Landfill Seep - 04 - 071318</u> <u>TRUCK SEEP 16 071318 OS</u>		Performance MS/SD (Yes or No): Field Filtered Sample (Yes or No): Form MS/SD (Yes or No): 2202B, 9040C, 9068, ORGFM, 28D 6040B, 7470A, 6010C, 6020F 2640C, Calcd - TDS Radium <u>26/208</u> CCR App II			
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:			
Empty Kit Relinquished by: Relinquished by: <u>[Signature]</u> Relinquished by: _____ Relinquished by: _____		Date: <u>7/13/18</u> Date/Time: <u>1630</u> Company: <u>AECON</u> Date/Time: <u>7/14/18</u> Company: <u>AECON</u> Date/Time: <u>5:10, 3.1</u> Company:			
Custody Seals Intact: <u>Yes</u> Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			



Chain of Custody Record



Client Information (Sub Contract Lab)		Lab FM: Cismeros, Roxanne	Carrier Tracking No(s): 490-75463.1
Client Contact: Shipping/Receiving		E-Mail: roxanne.cismeros@testamericainc.com	State of Origin: Kentucky
Company: TestAmerica Laboratories, Inc.		Address: 301 Alpha Drive, RIDC Park, Pittsburgh PA, 15238	Job #: 490-155661-1
Address: 301 Alpha Drive, RIDC Park, Pittsburgh PA, 15238		Phone: 412-963-7058 (Tel) 412-963-2468 (Fax)	Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)
Due Date Requested: 7/26/2018		Analysis Requested	
TAT Requested (days):		Total Number of Containers	
PO #:		Perform MS/MSD (Yes or No)	
WO #:		Field Filtered Sample (Yes or No)	
Project #: 49010431		6010C/2005A (MOD) Lithium	
Site: Big Rivers CCR		6020A/3005A (MOD) ICP/MS Metals	
Sample Date		7470A/7470A Prep Mercury	
Sample Time		Special Instructions/Note:	
Sample ID (Lab ID)		Metals - run once, upload together.	
River Seep-08-071318 (490-155661-1)	7/13/18 07:50 Central	X	1
River Seep-12-071318 (490-155661-2)	7/13/18 09:15 Central	X	1
River Seep-16-071318 (490-155661-3)	7/13/18 11:00 Central	X	1
River Seep-14-071318 (490-155661-4)	7/13/18 10:10 Central	X	1
River Seep-09-071218 (490-155661-5)	7/12/18 13:50 Central	X	1
River Seep-07-071218 (490-155661-6)	7/12/18 14:50 Central	X	1
River Seep-05-071218 (490-155661-7)	7/12/18 14:25 Central	X	1
Landfill Seep-01-071318 (490-155661-8)	7/13/18 12:20 Central	X	1
Landfill Seep-01-071318-DUP (490-155661-9)	7/13/18 12:20 Central	X	1

490-155661 Chain of Custody

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
 Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

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

Relinquished by: *[Signature]* Date: 7/18/18 13:20 Company: *[Signature]* Company: _____

Relinquished by: _____ Date: _____ Time: _____ Received by: _____ Company: _____

Relinquished by: _____ Date: _____ Time: _____ Cooler Temperature(s) °C and Other Remarks: _____

Custody Seal Intact: Yes No Custody Seal No.: _____

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Special Instructions/QC Requirements:

Login Sample Receipt Checklist

Client: Big Rivers Electric Corporation

Job Number: 490-155661-1

Login Number: 155661

List Number: 2

Creator: DiNardo, Nicholas J

List Source: TestAmerica Pittsburgh

List Creation: 07/17/18 12:54 PM

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

Tracer/Carrier Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
490-155661-1	River Seep-08-071318	87.3
490-155661-2	River Seep-12-071318	92.9
490-155661-5	River Seep-04-071218	89.4
490-155661-6	River Seep-07-071218	79.4
490-155661-7	River Seep-05-071218	82.9

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
490-155661-1	River Seep-08-071318	87.3	90.5
490-155661-2	River Seep-12-071318	92.9	85.6
490-155661-5	River Seep-04-071218	89.4	87.1
490-155661-6	River Seep-07-071218	79.4	87.1
490-155661-7	River Seep-05-071218	82.9	83.0

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

Appendix B

Supplemental Boring Logs and Cross-Sections

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-01
 Sheet 1 of 3

Date(s) Drilled	04/23/2019 12:00 AM to 04/24/2019 12:00 AM	Logged By	A. Burke	Checked By	M. Keown
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	68.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 1250 (ft NAD83)	Groundwater Level(s)	28 ft on 4/23/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:44:39 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0						Hard, moist, brown, lean clay (CL) with gravel [FILL]								
	2.5						Very stiff, moist, dark gray and light gray, mixture of lime and fly ash [FILL]								
391.5															
389.0	5														
	10														
385.0															
	13.0						- becomes wet								
381.0							Stiff, moist, brown, reddish brown, and gray mottled, lean CLAY (CL)								
380.0	15														
	20														
375.0															
	25														
370.0															
	30						- becomes wet								
364.0															
365.0															Water encountered at 28 ft bgs during drilling.



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-01

Project Location: Webster County, Kentucky

Sheet 2 of 3

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:44:39 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
30						Stiff, moist, brown, fat CLAY (CH)									
	16				2										
	17				2										
360															
	18				2		- becomes gray, with brown mottled								
	19				2										
355															
	20				2										
	21				2										
40															
	22				2										
350															
	23				2										
45															
	24				2										
345															
	25				2		- with wet, 4 inch seam of sand								
50															
	26				2		- with reddish brown ferrous nodules								
	27				2										
340															
55															
	28				2										
	29				2										
335															
60															
	30				2										
	31				2		Stiff, moist, brown, reddish brown, sandy lean CLAY (CL)								
	32				2										
330															
	33				2		Soft, very moist, gray, fat CLAY (CH)								
65															

Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-01

Project Location: Webster County, Kentucky

Sheet 3 of 3

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:44:39 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
		33			2	<div style="display: flex; justify-content: space-between; font-size: small;"> Elevation (feet) Depth (feet) </div>									
		34			2										
326.0		End of Boring at 68 ft													
325	70														
320	75														
315	80														
310	85														
305	90														
300	95														
295															
100															

Project: Sebree Station, Green Landfill Cutoff Trench	Log of Boring GESB-02
Project Location: Webster County, Kentucky	Sheet 1 of 2
Project Number: 60601031	

Date(s) Drilled: 04/25/2019 12:00 AM to 04/25/2019 12:00 AM	Logged By: A. Burke	Checked By: M. Keown
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 50.0 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 394 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E 1200 (ft NAD83)	Groundwater Level(s): 42 ft on 4/25/2019	

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:44:51 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0						Medium stiff, moist, brown, lean clay (CL) with gravel [FILL]								
	1														
	2						Medium dense, moist, dark gray (FILL)								
390	5						Soft, moist, dark gray and light gray, mixture of lime and fly ash (FILL)								
	3														
	4														
	5														
385	10														
	6														
	7						Medium stiff, moist, brown, reddish brown, and gray mottled, lean CLAY (CL)								
380	15						- becomes very stiff								
	8														
	9														
375	20														
	10														
	11														
	12														
370	25														
	13														
	14														
365	30														
	15														



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-02

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:44:51 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
30	16			2		- becomes stiff									
	17			2											
360	35			2			- becomes very stiff								
	18			2											
	19			2											
	20			2			Soft, very moist, gray, lean CLAY (CL)								
355	40			2											
	21			2											
	22			2			- becomes wet								
350	45			2											
	23			2											
	24			2			Stiff, very moist, gray and brown mottled, fat CLAY (CH)								
345	50			2											
	25			2											
	50						End of Boring at 50 ft								
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-03
 Sheet 1 of 2

Date(s) Drilled	04/25/2019 12:00 AM to 04/25/2019 12:00 AM	Logged By	A. Burke	Checked By	M. Keown
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	50.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 1150 (ft NAD83)	Groundwater Level(s)	9 ft on 4/25/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:44:58 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0														
393.0	1.0		1		2	Very stiff, moist, brown, yellowish brown, and gray lean clay (CL) with gravel [FILL]									
392.5	1.5					Medium dense, moist, dark gray (FILL)									
390.5	3.5		2		2	Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)									
388.5	5.5		3		2	Very stiff, moist, brown, brown, yellowish brown, lean CLAY (CL) [FILL]									
385.0	9.0		4		2	Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)									
383.0	11.0		5		2	Loose, wet, black (FILL)									
382.0	12.0		6		2	Medium stiff, very moist, black, brown, silty CLAY (CL-ML) with organics									
			7		2	Very stiff, moist, yellowish brown, brown, gray, lean CLAY (CL)									
			8		2										
			9		2										
			10		2										
			11		2										
			12		2										
			13		2										
			14		2										
			15		2										



Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:44:59 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
30															
	16														
	17														
360															
	18														
	19														
355															
	20														
	21														
	22														
350							350.0								
	23						Stiff, moist, gray, fat CLAY (CH)	44.0							
45															
	24														
	25						346.0								
345							Medium stiff, very moist, gray, lean CLAY (CL)	48.0							
50							344.0								
							End of Boring at 50 ft	50.0							
340															
	55														
335															
	60														
330															
	65														

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-04
 Sheet 1 of 2

Date(s) Drilled	04/25/2019 12:00 AM to 04/25/2019 12:00 AM	Logged By	A. Burke	Checked By	M. Keown
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	48.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	393 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 1100 (ft NAD83)	Groundwater Level(s)	4.25 ft on 1/31/2018		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:06 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
393.0	0						Very stiff, moist, yellowish brown, lean clay (CL) with gravel [FILL]								
391.0	2.0		1		2										
			2		2		Soft, moist, dark gray and light gray, mixture of lime and fly ash (FILL) - becomes wet								
	5		3		2										
			4		2		Medium dense, wet, dark gray, black (FILL)								
			5		2		Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)								
	10		6		2		Loose, wet, black (FILL)								
			7		2		Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)								
	15		8		2		Very stiff, moist, yellowish brown, brown, gray, lean CLAY (CL)								
			9		2										
			10		2										
	20		11		2										
			12		2										
	25		13		2										
			14		2										
			15		2										
	30														



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-04

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:06 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
30															
	16														
360	17														
	18														
35	19														
	20														
355	20						Stiff, moist, gray, fat CLAY (CH)								
	21														
40	22														
	23														
350	24														
	23						Medium stiff, wet, gray, lean CLAY (CL)								
45	24														
	24														
345							End of Boring at 48 ft								
50															
340															
55															
335															
60															
330															
65															

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-05
 Sheet 1 of 2

Date(s) Drilled	04/25/2019 12:00 AM to 04/25/2019 12:00 AM	Logged By	A. Burke	Checked By	M. Keown
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	48.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	393 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 1050 (ft NAD83)	Groundwater Level(s)	16 ft on 4/25/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:14 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)												
393.0	0						393.0	0.0									
	1				2	Very stiff, moist, yellowish brown, lean clay (CL) with gravel [FILL]											
	2				2	Loose, wet, dark gray, black (FILL)	391.0	2.0									
390	3				2	Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)	390.0	3.0									
	4				2	Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)											
5	5				2												
	6				2												
	7				2	Loose, wet, black (FILL)	387.0	6.0									
385	8				2	Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)											
	9				2	Loose, wet, black (FILL)	380.0	13.0									
	10				2	Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)	379.0	14.0									
	11				2	Loose, wet, black (FILL)											
	12				2	Very stiff, moist, yellowish brown, brown, gray, lean CLAY (CL)	377.0	16.0									
15	13				2		376.0	17.0									
	14				2												
	15				2												
20	20																
	21																
	22																
25	25																
	26																
	27																
30	30																



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-05

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:14 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)										
30		16		2											
360		17		2											
35		18		2											
		19		2											
355		20		2											
40		21		2		353.0	Medium stiff, moist, yellowish brown, fat CLAY (CH)	40.0							
		22		2											
350		23		2		349.0	Medium stiff, moist, yellowish brown, gray, lean CLAY (CL) with sand	44.0							
45		24		2											
						345.0	End of Boring at 48 ft	48.0							
345															
50															
340															
55															
335															
60															
330															
65															

Project: Sebree Station, Green Landfill Cutoff Trench	Log of Boring GESB-06
Project Location: Webster County, Kentucky	Sheet 1 of 2
Project Number: 60601031	

Date(s) Drilled: 04/26/2019 12:00 AM to 04/26/2019 12:00 AM	Logged By: A. Burke	Checked By: M. Keown
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 46.0 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 393 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E 1000 (ft NAD83)	Groundwater Level(s): 24 ft on 4/25/2019	

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:22 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)												
393.0	0						393.0	0.0									
	1				2	Very stiff, moist, yellowish brown, lean clay (CL) with gravel [FILL]											
	2				2	Medium stiff, wet, dark gray, black (FILL)	391.0	2.0									
390					2	Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL) - becomes wet	390.0	3.0									
	3				2												
	4				2												
385					2	Loose, wet, black (FILL)	385.0	8.0									
	5				2	Medium stiff, moist, dark gray and light gray, mixture of lime and fly ash (FILL)	384.0	9.0									
	6				2												
380					2												
	7				2												
	8				2												
375					2												
	9				2												
	10				2												
20					2	Loose, wet, black (FILL)	373.0	20.0									
	11				2	Medium stiff, moist, dark gray and light gray, mixture of fly ash and lime (FILL)	372.0	21.0									
370					2												
	12				2												
	13				2	- becomes wet											
25					2												
	14				2	Very stiff, moist, yellowish brown, brown, gray, lean CLAY (CL)	367.0	26.0									
365					2												
	15				2												
30					2												

Water encountered at 24 ft bgs



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-06

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:22 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)										
30		16		2											
360		17		2											
35		18		2											
		19		2											
355		20		2		354.0	Medium stiff, moist, yellowish brown, fat CLAY (CH)	39.0							
40		21		2											
		22		2											
350		23		2		349.0	Medium stiff, moist, yellowish brown, gray, lean CLAY (CL) with sand	44.0							
45						347.0	End of Boring at 46 ft	46.0							
345															
50															
340															
55															
335															
60															
330															
65															

Project: Sebree Station, Green Landfill Cutoff Trench	Log of Boring GESB-07
Project Location: Webster County, Kentucky	Sheet 1 of 2
Project Number: 60601031	

Date(s) Drilled: 04/26/2019 12:00 AM to 04/26/2019 12:00 AM	Logged By: A. Burke	Checked By: M. Keown
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 46.0 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 394 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E 950 (ft NAD83)	Groundwater Level(s): 28 ft on 4/25/2019	

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:30 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0						Very stiff, moist, yellowish brown, lean clay (CL) with gravel [FILL]								
392.0	2		1		2		Medium stiff, wet, dark gray, black (FILL)								
391.0	3		2		2		Medium stiff, very moist, dark gray and light gray, mixture of lime and fly ash (FILL)								
390	4		3		2										
	5		4		2										
385	6		5		2		- becomes wet								
	7		6		2										
380	8		7		2										
	9		8		2		- with 6" layer of bottom ash								
375	10		9		2										
	11		10		2										
370	12		11		2		- becomes wet								
	13		12		2		Very stiff, moist, yellowish brown, brown, gray, lean CLAY (CL)								
365	14		13		2										
	15		14		2										
364.0	15		15		2		- becomes wet								
	30														



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-07

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:30 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
30	16			2		Medium stiff, moist, yellowish brown, fat CLAY (CH)									
	17			2		- with sand and gravel									
360	18			2											
	19			2											
355	20			2											
40	21			2											
	22			2											
350	23			2		Medium stiff, moist, yellowish brown, gray, lean CLAY (CL) with sand	350.0	44.0							
45						End of Boring at 46 ft	348.0	46.0							
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench

Project Location: Webster County, Kentucky

Project Number: 60601031

Log of Boring GESB-08

Sheet 1 of 2

Date(s) Drilled	04/29/2019 12:00 AM to 04/29/2019 12:00 AM	Logged By	A. Burke	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	46.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 900 (ft NAD83)	Groundwater Level(s)	30 ft on 4/29/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:37 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0						Very stiff, dry, brown, yellowish brown, silty clay (CL) with gravel (FILL)								
391.0	3.0		1		4		Moist, dense, gray, fly ash and lime (FILL)								
	5		2		2		-becomes wet 6'-8'								
			3		2										
			4		2										
	10		5		2		-becomes wet 12'-14'								
			6		2										
	15		7		2										
			8		2										
			9		2										
	20		10		2		-becomes wet 20'-21'								
			11		2		Very stiff, dry/moist, yellowish brown, gray, brown, silty lean clay (CL)								
	25		12		2										
			13		2										
			14		2		-becomes sand								
	30														



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-08

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:37 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
30	15			2	<div style="display: flex; justify-content: space-between; padding: 5px;"> Elevation (feet) Depth (feet) </div>										
	16			2		-becomes without sand and less silt									
360						360.0	Moist, brown, yellowish brown, gray fat clay (CH)								
	17			2											
	18			2			-becomes gray -becomes wet 38'-39'								
355															
	19			2											
40															
	20			2											
	21			2			-becomes soft								
350															
45															
	22			2		348.0	End of Boring at 46 ft								
345															
50															
340															
55															
335															
60															
330															
65															

Project: Sebree Station, Green Landfill Cutoff Trench

Project Location: Webster County, Kentucky

Project Number: 60601031

Log of Boring GESB-09

Sheet 1 of 2

Date(s) Drilled	04/29/2019 12:00 AM to 04/29/2019 12:00 AM	Logged By	A. Burke	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	44.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	395 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 850 (ft NAD83)	Groundwater Level(s)	ft on 4/29/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:45 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
395.0	0					Loose, moist, brown, sand and gravel (FILL)									
394.8						Very stiff, moist, yellowish brown / brown, lean clay (CL)									
391.5	5					Wet, dark gray, fly ash and lime (FILL)									hit apparent rock refusal 2.5' offset 2' SW
		1	2												
		2	2												
		3	2												
		4	2												
	10	5	2			-3" bottom ash seam									
		6	2												
		7	2												
	15	8	2												
		9	2												
		10	2												
		11	2			Moist, brown, lean clay (CL)									
	20	12	2												
		13	2			-becomes mottled with gray									
		14	2			-increases in plasticity with silt pockets									part of sample
	25														
	30														



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-09

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:45 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
365	30														
			15		2										
			16		2										
360	35		17		2										
			18		2										
							357.5								
			19		2										
355	40		20		2		354.5								
			21		2										
							351.0								
350	45														
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-11

Project Location: Webster County, Kentucky

Sheet 1 of 2

Project Number: 60601031

Date(s) Drilled	04/29/2019 12:00 AM to 04/30/2019 12:00 AM	Logged By	A. Burke	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	56.5 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	398 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 800 (ft NAD83)	Groundwater Level(s)	40 ft on 4/29/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:53 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
398.0	0.0														
397.5	0.5					Gravel (FILL)									
396.0	2.0		1		2	Moist, brown/yellowish brown, lean clay (CL) with gravel and trace sand									
			2		2	Moist, gray, fly ash with lime (FILL)									
395	5		2		2	-becomes very moist									
			3		2										
390	10		4		2	-becomes wet									
			5		2										
385	15		6		2										
			7		2										
380	20		8		2	-becomes wet 16'-17'									
			9		2										
375	25		10		2										
			11		2										
370	27.8		12		2										
			13		2										
369.0	29.0		14		2	Moist, brown, yellowish brown, gray mottled lean clay (CL) with trace sand									
						Moist, brown, gray, yellowish brown, mottled fat clay (CH) with trace gravel									
30															

Project: Sebree Station, Green Landfill Cutoff Trench

Project Location: Webster County, Kentucky

Project Number: 60601031

Log of Boring GESB-11

Sheet 2 of 2

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:45:53 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
30	15			2		-shows trace organics									
365	16			2		-becomes more brown									
35	17			2											
	18			2		Moist, orangish, reddish brown, brown lean clay (CL) with trace sand	362.0	36.0							
360	19			2		-becomes wet on exterior of samples									
40	20			2		-becomes very wet, higher silt content									
	21			2		Wet, reddish brown, brown, silty lean clay (CL)	356.0	42.0							
355	22			2		-becomes very wet									
45	23			2		Moist, reddish, brown, gray, sandy lean clay (CL)	352.0	46.0							
350	24			2											
50	25			2		Moist, red, brown, tan clayey sand (CL)	347.5	50.5							
345	26			2											
55	27			2											
	28			.5		End of Boring at 56.5 ft	341.5	56.5							
340															
60															
335															
65															

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-12
 Sheet 1 of 2

Date(s) Drilled	04/30/2019 12:00 AM to 04/30/2019 12:00 AM	Logged By	A. Burke	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	46.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	398 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 750 (ft NAD83)	Groundwater Level(s)	ft on		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:01 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
398.0	0.0														
397.5	0.5					Gravel (FILL)									
			1		2	Very stiff, moist, yellowish brown / brown, lean clay (CL)									
395.5	2.5					Moist, gray, fly ash and lime (FILL)									
			2		2										
			3		2										
			4		2										
390	10		5		2										
			6		2										
385	15		7		2										
			8		2										
380	20		9		2										
			10		2										
375			11		2										
			12		2										
25			13		2										
371.5	26.5					Moist, yellowish brown / brown, lean clay (CL)									
			14		2										
370															
30															



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-12

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

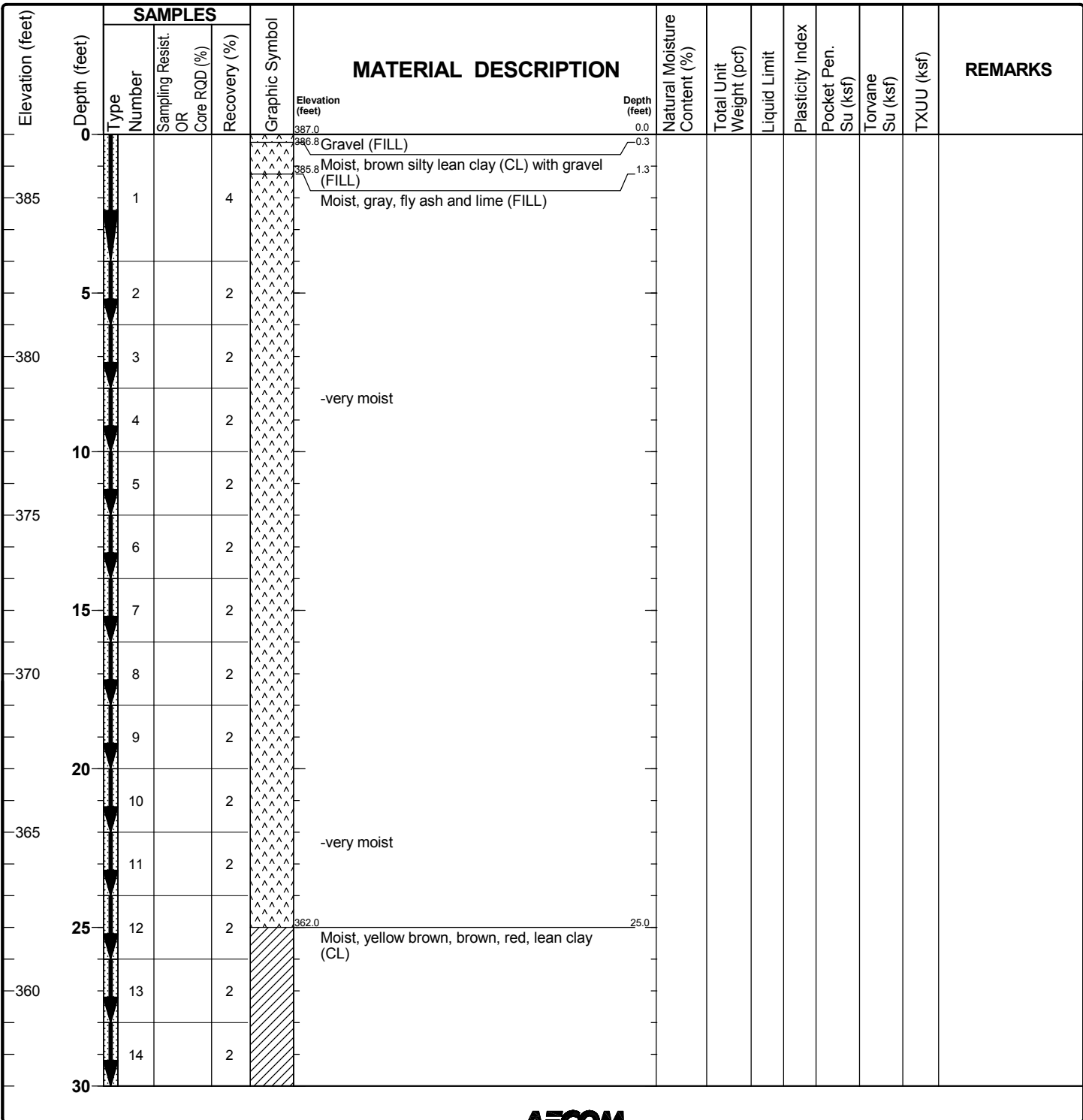
Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:01 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
30															
	15			2											
365	16			2											
	35														
	17			2											
	18			2											
360	19			2											
	40														
	20			2		Moist, reddish brown, brown fat clay (CH)	357.5								
	21			2											
355	22			2											
	45														
						End of Boring at 46 ft	352.0								
350															
	50														
	55														
345															
	60														
340															
	65														

Project: Sebree Station, Green Landfill Cutoff Trench	Log of Boring GESB-13
Project Location: Webster County, Kentucky	Sheet 1 of 2
Project Number: 60601031	

Date(s) Drilled: 04/30/2019 12:00 AM to 04/30/2019 12:00 AM	Logged By: A. Burke	Checked By:
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 44.0 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 387 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E 700 (ft NAD83)	Groundwater Level(s): ft on	

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:09 PM



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-13

Project Location: Webster County, Kentucky

Sheet 2 of 2

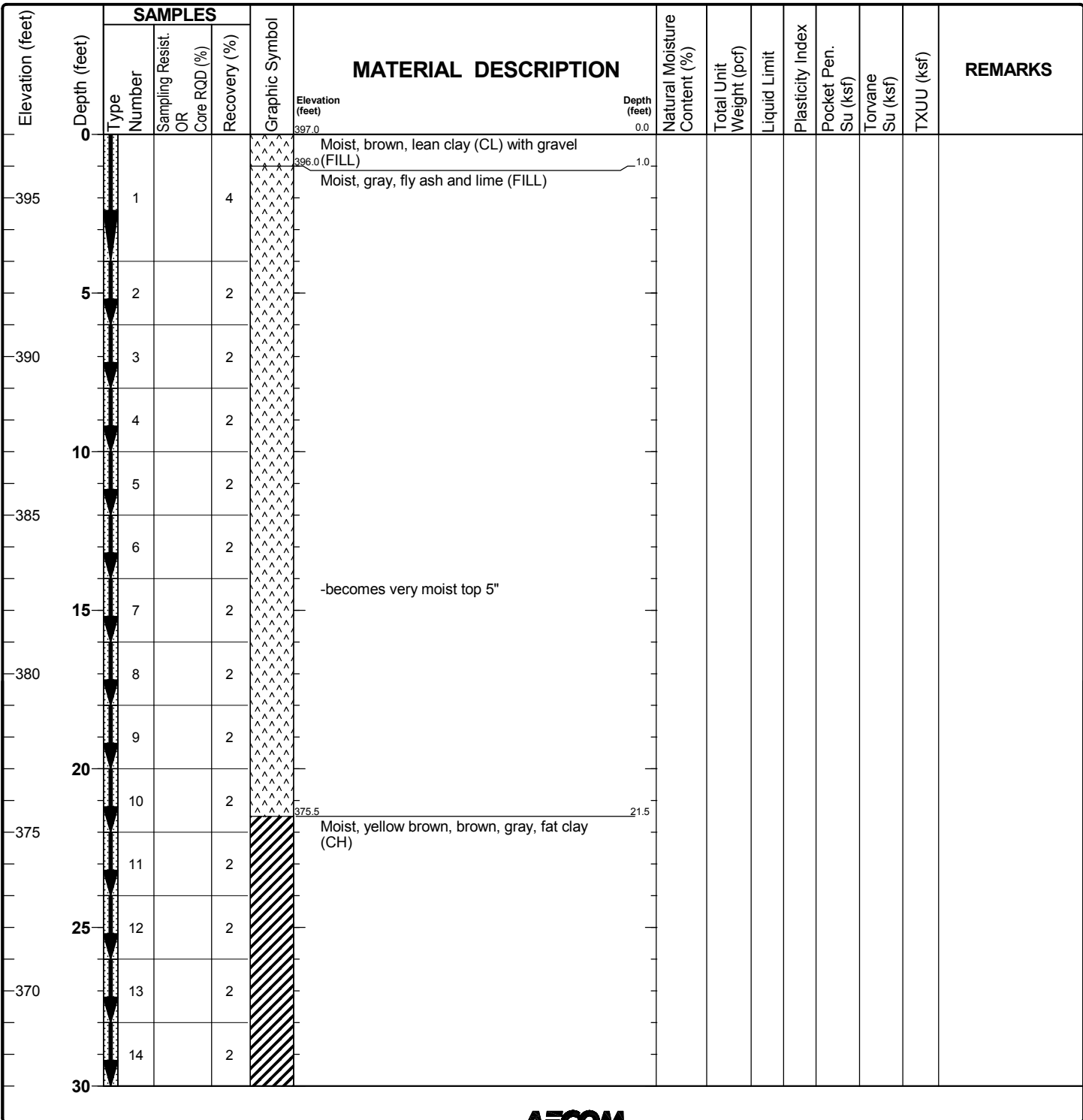
Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:09 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS	
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
30																
355	32.0		15		2	Moist, reddish brown, fat clay (CH)										
			16		2											
35			17		2											
350			18		2											
			19		2											
40			20		2											
345			21		2		-becomes fine grained sandy clay									
	44.0						End of Boring at 44 ft									
45																
340																
50																
335																
55																
330																
60																
325																
65																

Date(s) Drilled: 04/30/2019 12:00 AM to 04/30/2019 12:00 AM	Logged By: A. Burke	Checked By:
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 44.0 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 397 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E 650 (ft NAD83)	Groundwater Level(s): ft on	

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:17 PM



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-14

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:17 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
30															
365	15			2											
	16			2											
35	17			2											
	18			2											
360	19			2											
40	20			2											
355	21			2											
45															
350															
50															
345															
55															
340															
60															
335															
65															

Project: Sebree Station, Green Landfill Cutoff Trench	Log of Boring GESB-15
Project Location: Webster County, Kentucky	Sheet 1 of 2
Project Number: 60601031	

Date(s) Drilled: 05/01/2019 12:00 AM to 05/01/2019 12:00 AM	Logged By: A. Burke	Checked By:
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 44.0 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 396 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E 600 (ft NAD83)	Groundwater Level(s): ft on	

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:25 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
396.0	0					Gravel (FILL)	0.0								
395.5	0.5					Moist, gray, fly ash and lime (FILL)									
395	1		1		2										
	2		2		2										
390	5		3		2										
	4		4		2										
	5		5		2										
	6		6		2										
385	10		7		2										
	15		8		2		Wet, black, dary gray, bottom ash (FILL)								
380	15		9		2		Moist, yellowish brown, brown, gray mottled fat clay (CH)	15.0							
	18		10		2		Moist, silty lean clay (CL) with trace organics	18.0							
	20		11		2		Moist, yellow brown, brown, gray, mottled fat clay (CH)	21.0							
375	20		12		2		Moist, yellow brown, brown, gray mottled lean clay (CL)	22.5							
	25		13		2		Moist, yellow brown, brown, gray mottled lean clay (CL)	26.0							
370	25		14		2		-becomes reddish in color								
	30														



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-15

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:25 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
365	30					<div style="display: flex; justify-content: space-between; padding: 5px;"> Elevation (feet) Depth (feet) </div>									
	15			2											
	16			2											
35	35														
	17			2											
	18			2											
360							-increased silt content								
	19			2											
40	40														
	20			2			Moist, brown, reddish brown, fat clay (CH)								
355															
	21			2											
45	45						End of Boring at 44 ft								
350															
50	50														
345															
55	55														
340															
60	60														
335															
65	65														

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-16
 Sheet 1 of 2

Date(s) Drilled	05/01/2019 12:00 AM to 05/01/2019 12:00 AM	Logged By	A. Burke	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	44.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	395 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 550 (ft NAD83)	Groundwater Level(s)	42 ft on 5/1/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:33 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
395.0	0					Gravel (FILL)									
			1		3.5	Moist, brown, reddish brown, yellowish brown (FILL)									
	5		2		2	-becomes dark gray Moist, gray, fly ash and lime (FILL)									
			3		2										
			4		2										
	10		5		2										
			6		2										
	15		7		2	-becomes dark gray									
			8		2										
	20		9		2										
			10		2										
			11		2										
	25		12		2										
			13		2										
			14		2										
379.0						Moist, yellowish brown, brown, gray, lean clay (CL)									



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-16

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:33 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS	
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
365	30															
		15			2											
		16			2											
360	35							Moist, yellowish brown, brown, fat clay (CH)								
		17			2											
		18			2											
		19			2											
355	40															
		20			2											
		21			2			-becomes very moist, gray								
								End of Boring at 44 ft								
350	45															
345	50															
340	55															
335	60															
330	65															

Date(s) Drilled: 05/02/2019 12:00 AM to 05/02/2019 12:00 AM	Logged By: A. Burke	Checked By:
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 44.0 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 395 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E 500 (ft NAD83)	Groundwater Level(s): 43 ft on 5/2/2019	

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:41 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
395	0					Gravel (FILL)									
			1		4	Moist, yellowish brown, brown, lean clay (CL)									
	5		2		2	Moist, gray, fly ash and lime (FILL)									
			3		2										
			4		2										
	10		5		2										
			6		2										
	15		7		2										
			8		2	Moist, yellowish brown, brown, gray, lean clay (CL)									
			9		2										
	20		10		2										
			11		2	Moist, brown, yellowish brown, gray, fat clay (CH)									
	25		12		2	Moist, yellowish brown, brown, lean clay (CL)									
			13		2										
			14		2										
365	30														

Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-17

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:41 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
365	30														
			15		2										
			16		2		Moist, brown, yellowish brown, reddish brown, fat clay (CH)								
360	35		17		2		Moist, yellowish brown, brown, reddish brown, lean clay (CL)								
			18		2										
			19		2		Reddish brown, brown, fat clay (CH)								
355	40		20		2										
			21		2		-becomes wet, gray, silty								
							End of Boring at 44 ft								
350	45														
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-18
 Sheet 1 of 2

Date(s) Drilled	05/02/2019 12:00 AM to 05/02/2019 12:00 AM	Logged By	A. Burke	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	44.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 400 (ft NAD83)	Groundwater Level(s)	34 ft on 5/2/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:48 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0.0														
393.5	0.5					Gravel (FILL)									
392.5	1.5					Moist, brown, lean clay (CL)									
			1		4	Moist, gray, fly ash and lime (FILL)									
390	5		2		2										
			3		2										
385	10		4		2										
			5		2										
			6		2										
380	15		7		2										
			8		2										
375	20		9		2										
			10		2										
			11		2										
370	25		12		2										
			13		2										
365	30		14		2										



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-18

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

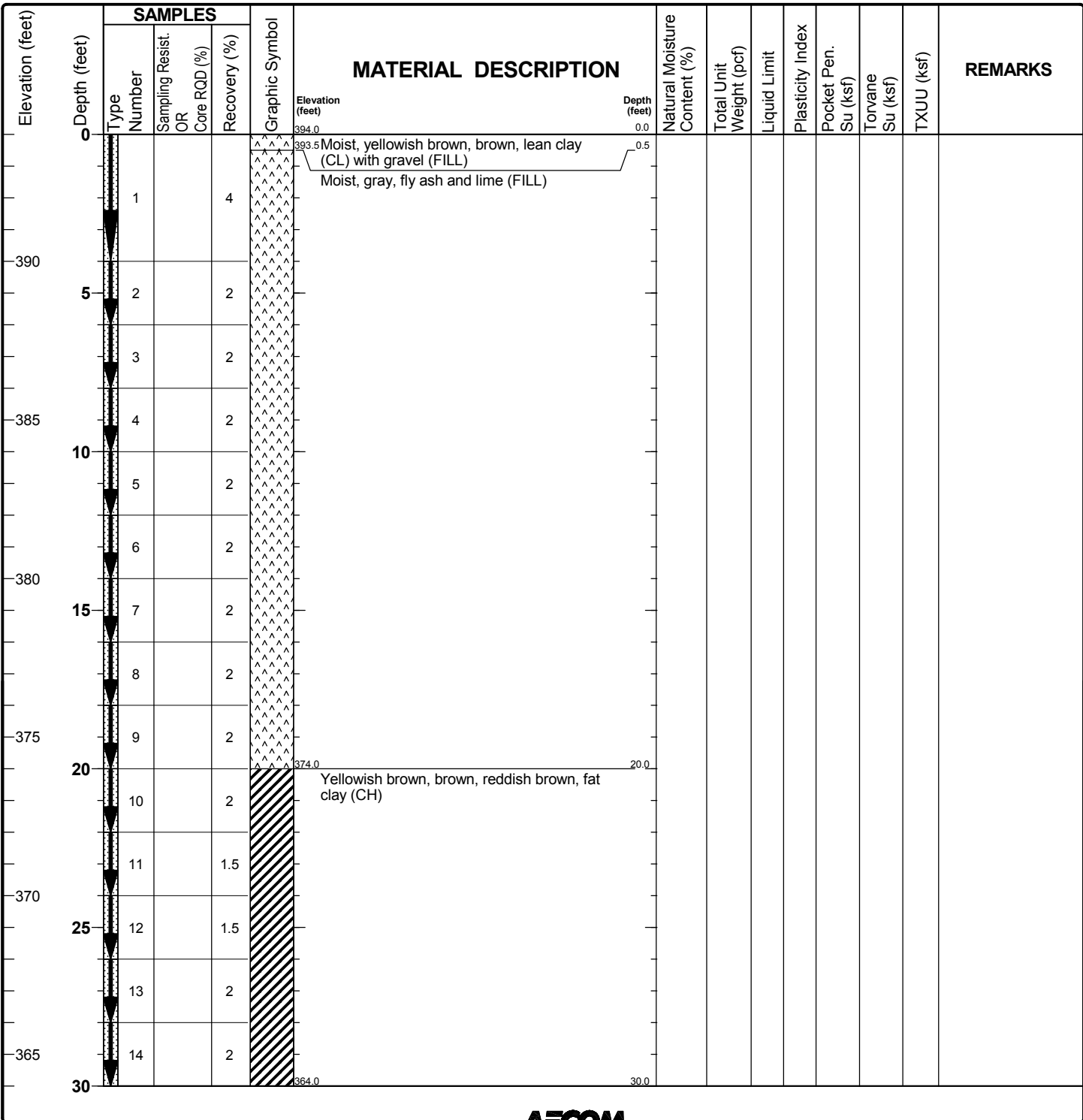
Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:48 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS	
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)												
30	15			2	[Hatched Pattern]	Moist, brown, yellowish brown, reddish brown, fat clay (CH)										
	16			2												
360	17			2			-becomes wet 34'-36'									
	18			2												
355	19			2			Moist, gray, fat clay (CH)									
	20			2			Moist, gray, lean clay (CL)									
350	21			2												
45						End of Boring at 44 ft										
345	50															
340	55															
335	60															
330	65															

Project: Sebree Station, Green Landfill Cutoff Trench	Log of Boring GESB-19
Project Location: Webster County, Kentucky	Sheet 1 of 2
Project Number: 60601031	

Date(s) Drilled: 05/02/2019 12:00 AM to 05/02/2019 12:00 AM	Logged By: A. Burke	Checked By:
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 42.0 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 394 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E 300 (ft NAD83)	Groundwater Level(s): ft on	

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:56 PM



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-19

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:46:56 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)										
30	15			2	[Diagonal Hatching]	Reddish brown, brown, gray, yellowish brown, lean clay (CL)									
	16			2											
360	35			2	[Diagonal Hatching]	Reddish brown, brown lean clay (CL)	359.0								
	18			2											
	35			2	[Diagonal Hatching]	Moist, brown, gray, mottled red, fat clay (CH)	356.0								
355	19			2											
40	20			2	[Diagonal Hatching]		352.0								
						End of Boring at 42 ft	42.0								
350	45														
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-20

Project Location: Webster County, Kentucky

Sheet 1 of 2

Project Number: 60601031

Date(s) Drilled	05/06/2019 12:00 AM to 05/06/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	33.9 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 200 (ft NAD83)	Groundwater Level(s)	20 ft on 5/6/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:03 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0.0														
	1					Moist, yellowish brown, lean clay (CL) with gravel [FILL]									
	2					Moist, gray, black, mixture of gravel, sand, fly ash and lime (FILL)									
389.5	5					Moist, gray, fly ash and lime (FILL)									Sample recovery over 100 percent below 4 ft bgs
	2					- becomes wet									
	3					- becomes moist									
	4														
385	10														
	5														
	6					- with few wood fragments and root fibers									
380	15					Moist, yellowish brown, lean CLAY (CL) with few weathered rock fragments [RESIDUUM]									
	7					- with gray mottling, becomes slightly moist									
	8														
375	20														Water encountered at 20 ft bgs during drilling.
	9					- becomes wet									
	10					Very moist, yellowish brown, SILTY CLAY (CL-ML) with sand									
	11					- becomes wet									
370	25					Moist, yellowish brown, orange, gray-brown, blocky, lean CLAY (CL)									
	12					-with wet seams 24.5 - 25.5, 26 - 27									
	13														
365	30														
	14														

Project: Sebree Station, Green Landfill Cutoff Trench

Project Location: Webster County, Kentucky

Project Number: 60601031

Log of Boring GESB-20

Sheet 2 of 2

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:04 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)										
30	15			2		Highly weathered, sandy SHALE, light brown, gray, with orange ferrous staining									
360	16			1.9		SHALE, gray	360.5 360.1								
35						End of Boring at 33.9 ft	33.5 33.9								
355	40														
350	45														
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-21

Project Location: Webster County, Kentucky

Sheet 1 of 1

Project Number: 60601031

Date(s) Drilled	05/06/2019 12:00 AM to 05/06/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	26.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E 100 (ft NAD83)	Groundwater Level(s)	20 ft on 5/6/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:11 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0.0														
	2.5					Moist, yellowish brown, lean clay (CL) with gravel (FILL)									
	391.5					Wet, dark gray, black, fly ash and lime (FILL)									
390	5					-becomes moist, gray, lightgray									
						-becomes wet									
						-becomes moist									
385	10					-becomes dry									
380	15					Moist, gray-brown, gray lean clay (CL) -becomes yellowish brown									
375	20					-with wet, CL-ML seams									
						-becomes moist, with high wear shale fragments									
370	25					Light brown, yellowish brown with orange staining, highly weathered sandy SHALE									
365	30					End of Boring at 26 ft									

Water encountered at 20 ft bgs during drilling.

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-22
 Sheet 1 of 1

Date(s) Drilled	05/06/2019 12:00 AM to 05/06/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	27.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E (ft NAD83)	Groundwater Level(s)	20 ft on 5/6/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:15 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0						Moist, yellowish brown, lean clay (CL) with gravel (FILL)								
392.0	2.0		1		4		Wet, black, gray, mixture of bottom ash, fly ash and lime (FILL)								
390	5		2		2		-becomes very moist								
			3		2		-becomes wet								
			4		2		-becomes slightly moist								
385	10		5		2		-becomes very moist								
			6		2		382.5-with 6" seam of bottom ash								
			7		2		Moist, yellowish brown, gray, lean clay (CL)								
380	15		8		2		-becomes slightly moist								
			9		2		-becomes very moist								
375	20		10		2		-becomes moist								
			11		2		-wet 19-19.5'								
			12		2		Wet, yellowish brown, gray silty clay (CL-ML)								
			13		1		Moist, yellowish brown, gray, lean clay (CL)								
370	25						-becomes slightly moist								
							-becomes wet								
							Moist, gray, orange-brown, sand silty clay (CL-ML)								
							Highly weathered sandy SHALE, lightly yellowish gray								
							End of Boring at 27 ft								
365	30														

Water encountered at 20 ft bgs during drilling.



Project: Sebree Station, Green Landfill Cutoff Trench

Project Location: Webster County, Kentucky

Project Number: 60601031

Log of Boring GESB-23

Sheet 1 of 2

Date(s) Drilled	05/06/2019 12:00 AM to 05/06/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	32.7 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E -150 (ft NAD83)	Groundwater Level(s)	ft on		

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:19 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0						Moist, yellowish brown, lean clay (CL) with gravel (FILL)								
392.5	1.5		1		3		Wet, black, bottom ash (FILL) -dark gray, fly ash and lime								
	5		2		2		-becomes wet -4" seam of bottom ash -becomes moist								
			3		2		-becomes slightly moist, light gray								
	10		4		2										
			5		2										
			6		2										
	15		7		2										
			8		2										
			9		2										
	20		10		2		-becomes wet								
			11		1.5		-with 4" seam of wet bottom ash								
			12		2		Very moist, gray-brown, lean clay (CL) with root fibers								
	25		13		2		-becomes yellowish brown, wet								
			14		2		-becomes yellowish brown, gray, with orange weathered sandstone fragment								
	30						Moist, yellowish brown, gray, blocky, fat clay								



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-23

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:20 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)										
30	30					(CH)									
	15			2											
	16			.7											
						Wet SANDSTONE, orange	361.5	32.5							
						End of Boring at 32.7 ft	361.3	32.7							
360	35														
355	40														
350	45														
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-24
 Sheet 1 of 2

Date(s) Drilled	05/06/2019 12:00 AM to 05/06/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	40.8 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E -300 (ft NAD83)	Groundwater Level(s)	ft on		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:27 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0						Moist, brown, yellowish brown, lean clay (CL) with gravel (FILL)								
392.5	1.5		1		3.5		Moist, gray, fly ash and lime (FILL)								
390	5		2		2		-becomes very moist								
			3		2		-becomes slightly moist								
385	10		4		1.5		-becomes wet								
			5		2		-becomes moist								
			6		2		-becomes wet								
380	15		7		2		Moist, yellowish brown, lean clay (CL)								
			8		2		-becomes wet								
375	20		9		2		-becomes moist -wet seam 19'-19.5'								
			10		2		-wet seam 20'-20.5'								
370	25		11		2										
			12		2										
			13		2										
365	30		14		2		-becomes very moist								



Project: Sebree Station, Green Landfill Cutoff Trench

Project Location: Webster County, Kentucky

Project Number: 60601031

Log of Boring GESB-24

Sheet 2 of 2

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:27 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
30	15			2	<div style="position: absolute; top: 0; left: 0; right: 0; bottom: 0; display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: 8px; margin-right: 5px;">Elevation (feet)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: 8px; margin-right: 5px;">Depth (feet)</div> </div>	-becomes moist, orange-brown, with weathered sandstone fragments									
	16			2											
360	17			1.5			-with black ferrous modules								
	18			2											
355	19			2											
40	20			0.8			-becomes moist with poorly cemented sandstone fragments								
							Light yellow, orange weathered SANDSTONE								
							End of Boring at 40.8 ft								
350	45														
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-25
 Sheet 1 of 2

Date(s) Drilled	05/07/2019 12:00 AM to 05/07/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	44.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E -450 (ft NAD83)	Groundwater Level(s)	ft on		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:35 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0														
393.5	0.5					Moist, yellowish brown, lean clay (CL) with gravel (FILL)									
393.0	1.0					Wet, black, dark gray, bottom-ash with fly ash									
			1		4	Moist, gray, light gray, mixture of fly ash and lime									
390	5		2		2										
			3		2										
385	10		4		2										
			5		2										
			6		2										
380	15		7		2										
			8		2										
375	20		9		2										
			10		2										
			11		2										
370	25		12		2										
			13		2										
365			14		2										
360	30														



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-25

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:35 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
30	15			2											
	16			2		-becomes slightly moist, with orange weathered sandstone fragments -becomes moist									
360	35			2											
	18			2		-becomes very moist, gray, light brown, with orange brown									
355	40			2											
	19			2											
350	20			2		-becomes wet, gray									
	21			2											
350	45					End of Boring at 44 ft									
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-26
 Sheet 1 of 2

Date(s) Drilled	05/07/2019 12:00 AM to 05/07/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	44.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	395 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E -600 (ft NAD83)	Groundwater Level(s)	10 ft on 5/7/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCS\PROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:42 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
395	0					Moist, yellowish brown, orange, lean clay (CL) with sand and gravel (FILL)									
			1		3		Wet, black, dark gray, mixture of bottom ash and fly ash								
	5		2		2		Moist, gray, light gray, mixture of fly ash and lime								
			3		2										
			4		2		-becomes very moist								
	10		5		1.5										
							Moist, dark grayish green, lean clay (CL) with root fragments (RESIDUUM)								
			6		2		Moist, yellowish brown with light brown mottled, lean clay (CL)								
	15		7		2										
			8		2		-with gray mottled								
			9		2										
	20		10		2		-becomes slightly moist								
							-becomes moist								
			11		2										
	25		12		2		-becomes very moist								
							-becomes moist								
			13		2										
							-becomes slightly moist								
			14		2		-becomes moist								
	30														

Water encountered at 10 ft bgs during drilling.



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-26

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:42 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
365	30														
		15		2		-wet seam									
		16		1.5											
360	35	17		2		360.5 - becomes reddish brown, slightly moist Moist, gray, lean to fat clay (CL-CH)	34.5								
		18		2											
		19		2		357.0 Very moist, gray, lean clay (CL)	38.0								
355	40	20		2											
		21		2		-with orange-brown ferrous modules									
						351.0 End of Boring at 44 ft	44.0								
350	45														
345	50														
340	55														
335	60														
330	65														

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-27
 Sheet 1 of 2

Date(s) Drilled	05/07/2019 12:00 AM to 05/07/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	38.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	395 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E -750 (ft NAD83)	Groundwater Level(s)	1.5 ft on 5/7/2019		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:50 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)												
395	0						395.0	0.0									
			1		4		Moist, yellowish brown, lean clay (CL) with gravel (FILL)		1.3								
	5		2		2		Wet, dark gray, mixture of bottom ash and fly ash										
			3		2		Moist, gray, mixture of fly ash and lime										
			4		2												
	10		5		2		-becomes light gray										
			6		2												
			7		2		Moist, yellowish brown, light brown, gray (FILL)	381.5	13.5								
	15		8		2		Moist, greenish gray, with organics, lean clay (CL)	380.0	15.0								
			9		2		-becomes very moist, yellowish brown, light brown and gray mottled										
	20		10		2		-becomes very moist										
			11		2		-becomes moist										
	25		12		2		-very moist 25'-25.5'										
			13		2												
			14		2		-wet seam at 29'										
365	30																



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-27

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:50 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS	
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
365	30					Elevation (feet) 357.0 End of Boring at 38 ft 38.0										
			15		2											
			16		2			-becomes very moist								
360	35		17		2			-becomes moist								
			18		2											
355	40															
350	45															
345	50															
340	55															
335	60															
330	65															

Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GESB-28
 Sheet 1 of 2

Date(s) Drilled	05/07/2019 12:00 AM to 05/07/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	40.2 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	394 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N E -900 (ft NAD83)	Groundwater Level(s)	ft on		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:57 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
394.0	0						Moist, yellow brown, lean clay (CL) (FILL)								
	1						Very moist, black, bottom ash and fly ash Moist, gray, mixture of fly ash and lime								
390	5														
	2														
	3														
385	10														
	4														
	5														
380	15														
	6														
	7														
	8														
375	20														
	9														
	10														
	11														
370	25														
	12														
	13														
365	30														
	14														



Project: Sebree Station, Green Landfill Cutoff Trench

Log of Boring GESB-28

Project Location: Webster County, Kentucky

Sheet 2 of 2

Project Number: 60601031

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:47:57 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)	Elevation (feet)										
30	15			2	[Hatched Pattern]	-with orange-brown weathered sandstone modules									
	16			2		-becomes very moist									
360															
	17			2		-becomes moist									
	18			2											
355	19			2											
40	20			.2	[Dotted Pattern]	SANDSTONE, yellow-brown, poorly cemented	354.5	39.5							
						End of Boring at 40.2 ft	353.8	40.2							
350	45														
345	50														
340	55														
335	60														
330	65														

Date(s) Drilled: 05/08/2019 12:00 AM to 05/08/2019 12:00 AM	Logged By: M. Keown	Checked By:
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 25.2 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 393 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N E -1050 (ft NAD83)	Groundwater Level(s): ft on	

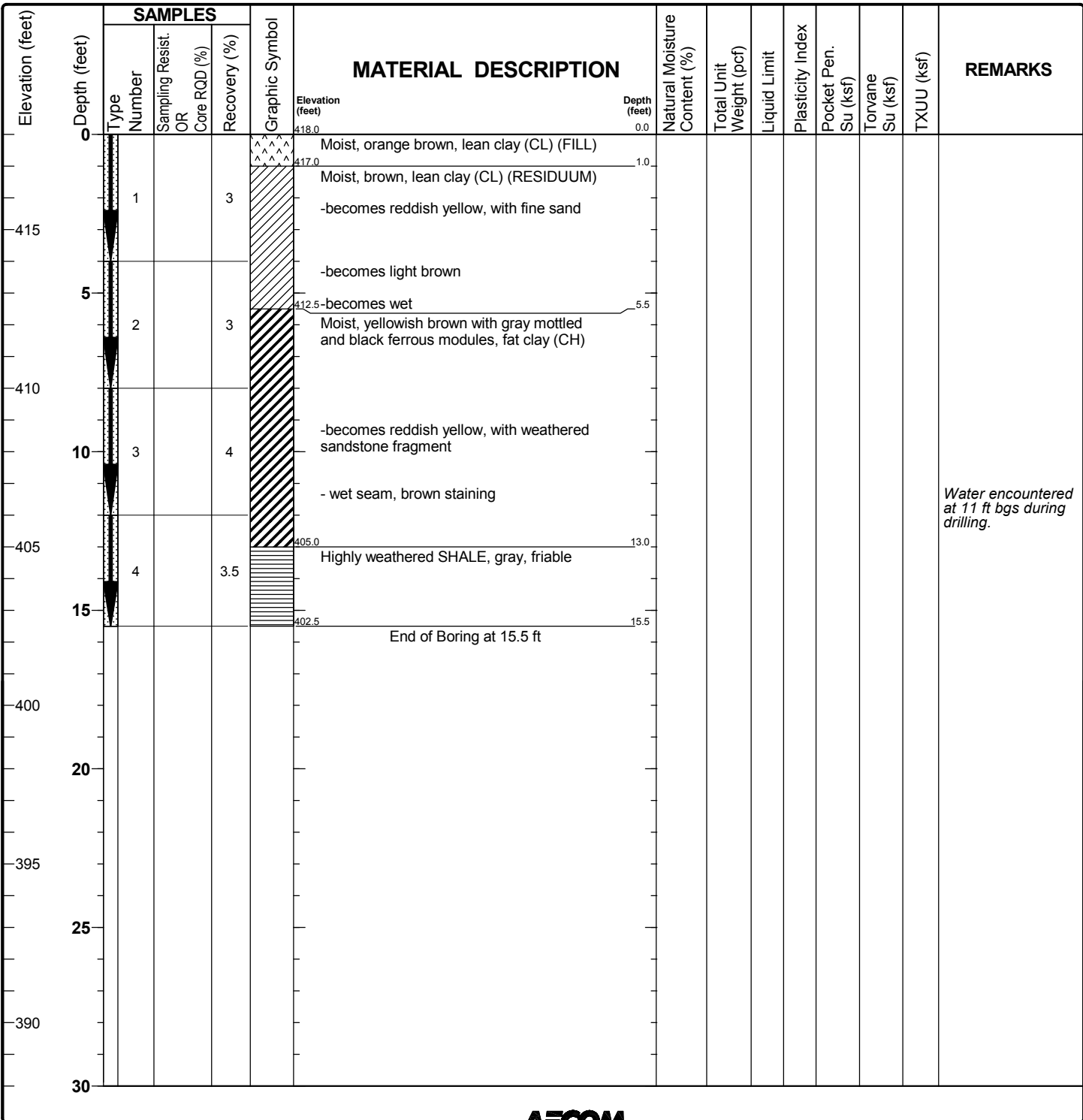
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Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)										
393.0	0.0														
392.0	1.0					Moist, yellow-brown, brown, lean clay (CL)									
			1		3.5	Moist, gray, mixture of fly ash and lime									
390															
	5		2		2										
			3		2										
386.0	7.0					Moist, yellowish brown and gray mottled, fat clay (CH)									
			4		2										
	10		5		2										
			6		2										
380.5	12.5					Very moist, yellowish brown, light brown, lean clay (CL) with sand									
379.0	14.0					Moist, with very moist seams, yellow-brown, with gray mottled, fat clay (CH)									
			7		2										
			8		2										
	20		9		2										
			10		2										
371.0	22.0					Very moist to wet, yellowish brown, yellow, sandy lean clay (CL)									
			11		2										
368.5	24.5					Weathered SANDSTONE, brown, yellowish brown									
367.8	25.2		12		1.2										
						End of Boring at 25.2 ft									
365															
30															

Project: Sebree Station, Green Landfill Cutoff Trench	Log of Boring GNWSB-1
Project Location: Webster County, Kentucky	Sheet 1 of 1
Project Number: 60601031	

Date(s) Drilled: 05/08/2019 12:00 AM to 05/08/2019 12:00 AM	Logged By: M. Keown	Checked By:
Drilling Method: GeoProbe Core	Drill Bit Size/Type: GeoProbe Core	Borehole Depth: 15.5 ft
Drill Rig Type: GeoProbe 7822DT	Drilling Contractor: AST Environmental	Surface Elevation: 418 ft NAVD88
Borehole Backfill: Bentonite Chips	Sampling Method(s): Direct Push	Hammer Data: N/A
Boring Location: N 1500 E 1000 (ft NAD83)	Groundwater Level(s): 11 ft on 5/8/2019	

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:48:09 PM



Project: Sebree Station, Green Landfill Cutoff Trench
 Project Location: Webster County, Kentucky
 Project Number: 60601031

Log of Boring GNWSB-2
 Sheet 1 of 1

Date(s) Drilled	05/08/2019 12:00 AM to 05/08/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	10.2 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	411 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N 1450 E 1000 (ft NAD83)	Groundwater Level(s)	ft on		

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIBIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:48:13 PM

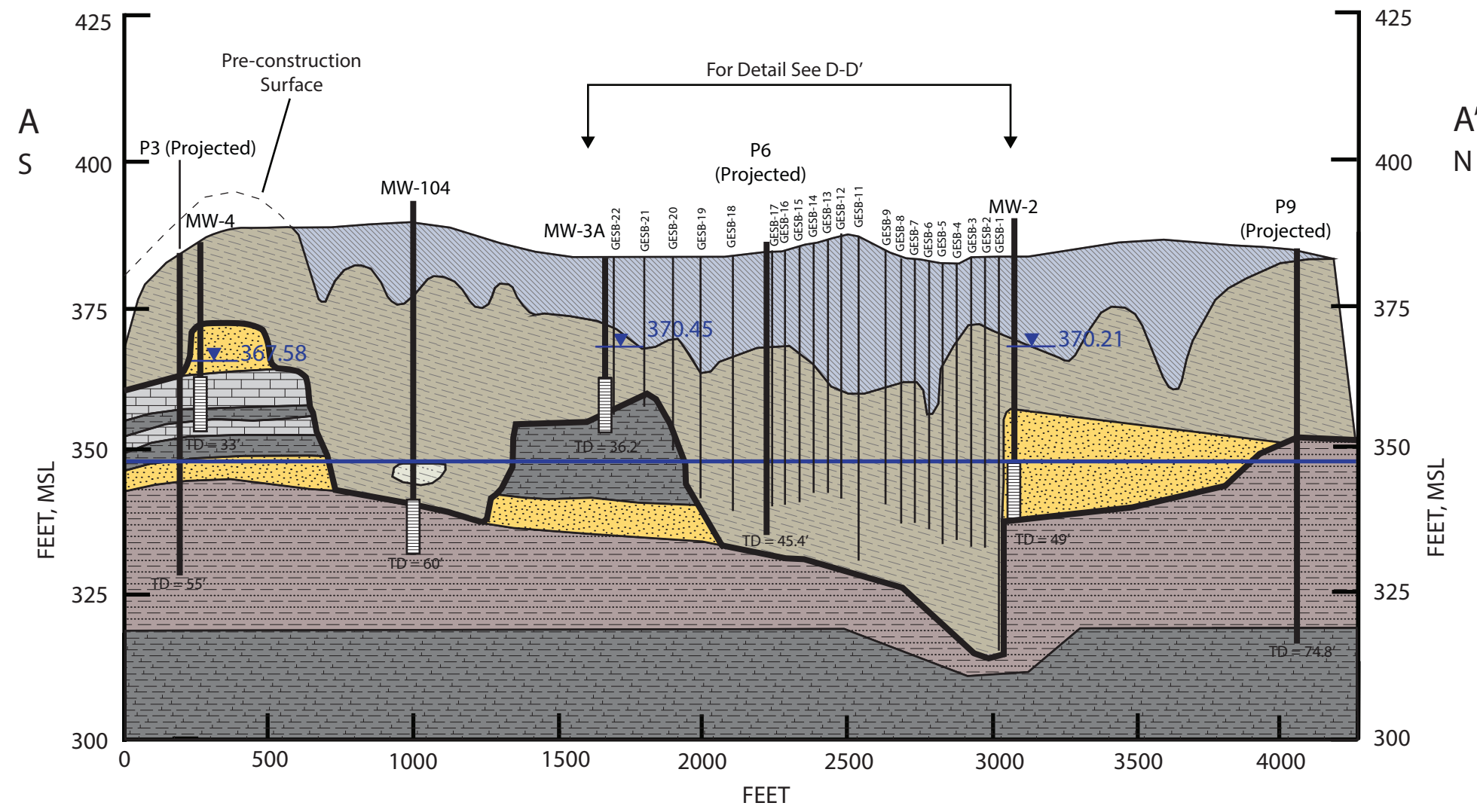
Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type Number	Sampling Resist. OR Core RQD (%)	Recovery (%)											
411.0	0.0					Moist, orange brown, lean clay (CL) (FILL)									
410.0	1.0	1		3		Moist, dark gray, greenish gray, lean clay (CL) Very moist, reddish yellow, lean clay (CL)									
405.0	5.0	2		3		-becomes yellowish brown, orange, with black ferrous modules									
403.0	8.0					Moist, yellowish brown, orange, with gray mottled, fat clay (CH)									
402.0	9.0	3		2.2		Moist, yellowish red, sandy lean clay (CL) with weathered sandstone fragments									
400.8	10.2					End of Boring at 10.2 ft									



Date(s) Drilled	05/08/2019 12:00 AM to 05/08/2019 12:00 AM	Logged By	M. Keown	Checked By	
Drilling Method	GeoProbe Core	Drill Bit Size/Type	GeoProbe Core	Borehole Depth	11.0 ft
Drill Rig Type	GeoProbe 7822DT	Drilling Contractor	AST Environmental	Surface Elevation	411 ft NAVD88
Borehole Backfill	Bentonite Chips	Sampling Method(s)	Direct Push	Hammer Data	N/A
Boring Location	N 1500 E 1050 (ft NAD83)		Groundwater Level(s)	6 ft on 5/8/2019	

Report: GEO_SOIL; File G:\LOUISVILLE\DCSPROJECTS\BIG RIVERS\60601031 - GREEN GEOPROBING\400_TECHNICAL LOGS\GREEN LANDFILL LOGS DRAFT.GPJ; 5/21/2019 1:48:16 PM

Elevation (feet)	Depth (feet)	SAMPLES				Graphic Symbol	MATERIAL DESCRIPTION	Elevation (feet)	Depth (feet)	Natural Moisture Content (%)	Total Unit Weight (pcf)	Liquid Limit	Plasticity Index	Pocket Pen. Su (ksf)	Torvane Su (ksf)	TXUU (ksf)	REMARKS
		Type	Number	Sampling Resist. OR Core RQD (%)	Recovery (%)												
411.0	0.0						411.0	0.0									
410.0	1.0		1		3	(Symbol: Triangles)	Moist, orange-brown, brown, lean clay with sand (CL) (FILL)	409.0	2.0								
405.0	6.0		2		2.5	(Symbol: Diagonal Lines)	Moist, gray-brown, dark gray, lean clay (CL) with root fibers -wet seam at 5'	404.5	6.5								
400.0	11.0		3		3	(Symbol: Diagonal Lines)	Moist, reddish yellow, fat clay (CH) with sandstone fragments -becomes gray, dark gray	400.0	11.0								
							End of Boring at 11 ft										Water encountered at 6 ft bgs during drilling.



LEGEND

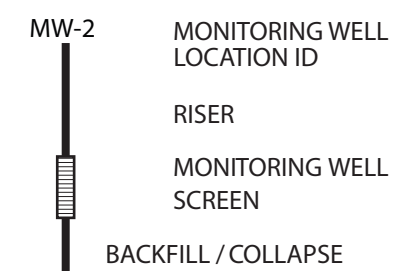
UNCONSOLIDATED MATERIALS:

- Fill
- Silt
- Silty Clay
- Clayey Silt

BEDROCK LITHOLOGIES:

- Sandstone
- Shale
- Limestone
- Interbedded Sandstone and Shale

- Potentiometric Surface September 28, 2018
- Green River Elevation (348 ft)



Green Station Webster County, Kentucky	
FIGURE 4 CROSS SECTION A - A'	
DATE: 05/21/2019	SCALE: AS SHOWN
CREATED BY: MRH	
JOB NO. 60602365	

Appendix C

Northwest Seep Laboratory Analytical Results

Certificate of Analysis 9042044

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 04/16/2019 10:36

Project Name: Reid/Green/Sebree Station

Workorder: 9042044

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 04/03/2019 12:12.

McCoy & McCoy Laboratories, Inc. is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please visit our website at www.mccoylabs.com for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

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#460210
Madisonville



Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



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 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9042044-01	RS1/Green Landfill Site	Water	04/02/2019 15:45	04/03/2019 12:12	Gregory Dick
9042044-02	SW-CULVERT-1/Green Landfill Site	Water	04/02/2019 13:43	04/03/2019 12:12	Gregory Dick

ANALYTICAL RESULTS

Lab Sample ID: **9042044-01**
 Description: **RS1 Green Landfill Site**

Sample Collection Date Time: 04/02/2019 15:45
 Sample Received Date Time: 04/03/2019 12:12

Volatile Organic Compounds

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
1,1,1-Trichloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,1,2,2-Tetrachloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,1,2-Trichloroethane	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,1-Dichloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,1-Dichloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,2,4-Trichlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,2,4-Trimethylbenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,2-Dichlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,2-Dichloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,2-Dichloropropane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,3,5-Trimethylbenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,3-Dichlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,3-Dichloropropane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
1,4-Dichlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
2-Butanone	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
2-Chloroethylvinyl Ether	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
2-Hexanone	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
2-Nitropropane	ND	u	ug/L	10	5	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
4-Methyl-2-pentanone	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Acetone	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Acrolein	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Acrylonitrile	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Benzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Bromodichloromethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Bromoform	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Bromomethane	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Carbon disulfide	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Carbon tetrachloride	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Chlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Chloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Chloroform	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Chloromethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
cis-1,2-Dichloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
cis-1,3-Dichloropropene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Dibromochloromethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Dichlorodifluoromethane	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Diethyl ether	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Ethylbenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Hexachloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Isopropylbenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
m,p-Xylene	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Methyl tert-Butyl Ether	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Methylene Chloride	2	J	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM

Volatile Organic Compounds

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Nitrobenzene	ND	u	ug/L	10	5	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
o-Xylene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Styrene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Tetrachloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Tetrahydrofuran	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Toluene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
trans-1,2-Dichloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
trans-1,3-Dichloropropene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Trichloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Trichlorofluoromethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Vinyl Acetate	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM
Vinyl chloride	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:02	HEM

Surrogate: Bromofluorobenzene 94.3 % 85.1-114.2 04/03/2019 16:52 04/04/2019 16:02 HEM SW846-8260 B

Base Neutral and Acid Extractable Organics

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
1,2,4-Trichlorobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
1,2-Dichlorobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
1,2-Diphenylhydrazine	ND	u	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
1,3-Dichlorobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
1,4-Dichlorobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2,2'-oxybis-(1-Chloropropane)	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2,4,5-Trichlorophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2,4,6-Trichlorophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2,4-Dichlorophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2,4-Dimethylphenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2,4-Dinitrophenol	ND	L2, v7, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2,4-Dinitrotoluene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2,6-Dinitrotoluene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2-Chloronaphthalene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2-Chlorophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2-Methylnaphthalene	ND	u	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2-Methylphenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2-Nitroaniline	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
2-Nitrophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
3,3'-Dichlorobenzidine	ND	u	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
3-Nitroaniline	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
4,6-Dinitro-2-methylphenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
4-Bromophenyl-phenylether	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
4-Chloro-3-methylphenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
4-Chloroaniline	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
4-Chlorophenyl-phenylether	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
4-Methylphenol	ND	u	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
4-Nitroaniline	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
4-Nitrophenol	ND	v7, L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Acenaphthene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Acenaphthylene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR

Base Neutral and Acid Extractable Organics

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
alpha-Terpineol	ND	v7, U	ug/L	5		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Anthracene	ND	L2, U	ug/L	15		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Benzidine	ND	U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Benzo(a)anthracene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Benzo(a)pyrene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Benzo(b)fluoranthene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Benzo(g,h,i)perylene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Benzo(k)fluoranthene	ND	L1, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Benzoic acid	ND	v7, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Benzyl alcohol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Bis(2-chloroethoxy)methane	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Bis(2-chloroethyl) ether	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Bis(2-ethylhexyl)phthalate	ND	L2, U	ug/L	40		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Butylbenzylphthalate	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Carbazole	ND	v7, U	ug/L	11		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Chrysene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Dibenzo(a,h)anthracene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Dibenzofuran	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Diethylphthalate	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Dimethylphthalate	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Di-n-butylphthalate	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Di-n-octylphthalate	ND	v7, L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Fluoranthene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Fluorene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Hexachlorobenzene	ND	L2, U	ug/L	13		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Hexachlorobutadiene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Hexachlorocyclopentadiene	ND	v7, L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Hexachloroethane	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Indeno(1,2,3-cd)pyrene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Isophorone	ND	U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Naphthalene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Nitrobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
N-Nitrosodimethylamine	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
N-Nitroso-di-n-propylamine	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
N-Nitrosodiphenylamine	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Pentachlorophenol	ND	v7, L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Phenanthrene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Phenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Pyrene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR
Pyridine	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 15:37	JDR

Surrogate: 2,4,6-Tribromophenol	59.2 %	45-85	04/03/2019 17:00	04/08/2019 15:37	JDR	SW846-8270 C
Surrogate: 2-Fluorobiphenyl	59.8 %	16-99	04/03/2019 17:00	04/08/2019 15:37	JDR	SW846-8270 C
Surrogate: 2-Fluorophenol	39.0 %	30-77	04/03/2019 17:00	04/08/2019 15:37	JDR	SW846-8270 C
Surrogate: Nitrobenzene-d5	49.6 %	25-157	04/03/2019 17:00	04/08/2019 15:37	JDR	SW846-8270 C
Surrogate: Phenol-d6	48.5 %	21-93	04/03/2019 17:00	04/08/2019 15:37	JDR	SW846-8270 C
Surrogate: Terphenyl-d14	74.6 %	30-125	04/03/2019 17:00	04/08/2019 15:37	JDR	SW846-8270 C

Metals by EPA 200 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Aluminum	0.27	D2, J	mg/L	0.40	0.14	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Antimony	ND	u	mg/L	0.005	0.002	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 11:59	DMH
Arsenic	ND	D3, u	mg/L	0.0100	0.0020	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Barium	0.098		mg/L	0.004	0.001	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 11:59	DMH
Beryllium	ND	D2, u	mg/L	0.0200	0.0100	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Boron	1.15	D2	mg/L	1.00	1.00	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:13	AKB
Cadmium	0.0005	J	mg/L	0.0010	0.0001	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 11:59	DMH
Calcium	1150	D1	mg/L	400	130	EPA 200.7 REV 4.4	04/05/2019 11:19	04/09/2019 11:29	AKB
Chromium	ND	D2, u	mg/L	0.0200	0.0060	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Cobalt	ND	D2, u	mg/L	0.040	0.040	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Copper	ND	D2, u	mg/L	0.030	0.010	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Iron	18.1	D2	mg/L	1.20	0.500	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:13	AKB
Lead	0.002		mg/L	0.002	0.0005	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 11:59	DMH
Lithium	0.06	D2, J	mg/L	0.20	0.05	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Magnesium	49.6	D2	mg/L	2.00	0.900	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:13	AKB
Manganese	20.5	D1	mg/L	0.400	0.200	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:16	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 11:59	DMH
Molybdenum	ND	D2, u	mg/L	0.10	0.02	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Nickel	ND	D2, u	mg/L	0.030	0.010	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Potassium	301	D1, L1	mg/L	50.0	22.0	EPA 200.7 REV 4.4	04/05/2019 11:19	04/09/2019 11:26	AKB
Selenium	ND	D2, u	mg/L	0.030	0.010	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Silver	ND	u	mg/L	0.0010	0.0004	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 11:59	DMH
Sodium	277	D1	mg/L	26.0	10.0	EPA 200.7 REV 4.4	04/05/2019 11:19	04/09/2019 11:26	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 11:59	DMH
Vanadium	ND	D2, u	mg/L	0.040	0.020	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH
Zinc	ND	D2, u	mg/L	0.20	0.20	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 19:54	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Total Dissolved Solids	6770		mg/L	50	50	2540 C-1997	04/04/2019 17:06	04/05/2019 16:24	JTL
Total Suspended Solids	336		mg/L	10.0	10.0	2540 D-2011	04/04/2019 16:10	04/04/2019 16:10	ARC

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
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Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	4090	D	mg/L	200	128	EPA 300.0 REV 2.1	04/04/2019 09:33	04/04/2019 09:33	CSC
Fluoride	ND	u	mg/L	0.2		EPA 300.0 REV 2.1	04/04/2019 09:17	04/04/2019 09:17	CSC
Sulfate	3040	D	mg/L	100	50.0	EPA 300.0 REV 2.1	04/04/2019 09:17	04/04/2019 09:17	CSC

ANALYTICAL RESULTS

Lab Sample ID: **9042044-02**
 Description: **SW-CULVERT-1 Green Landfill Site**

Sample Collection Date Time: 04/02/2019 13:43
 Sample Received Date Time: 04/03/2019 12:12

Volatile Organic Compounds

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
1,1,1-Trichloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,1,2,2-Tetrachloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,1,2-Trichloroethane	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,1-Dichloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,1-Dichloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,2,4-Trichlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,2,4-Trimethylbenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,2-Dichlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,2-Dichloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,2-Dichloropropane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,3,5-Trimethylbenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,3-Dichlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,3-Dichloropropane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
1,4-Dichlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
2-Butanone	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
2-Chloroethylvinyl Ether	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
2-Hexanone	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
2-Nitropropane	ND	u	ug/L	10	5	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
4-Methyl-2-pentanone	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Acetone	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Acrolein	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Acrylonitrile	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Benzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Bromodichloromethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Bromoform	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Bromomethane	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Carbon disulfide	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Carbon tetrachloride	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Chlorobenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Chloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Chloroform	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Chloromethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
cis-1,2-Dichloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
cis-1,3-Dichloropropene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Dibromochloromethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Dichlorodifluoromethane	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Diethyl ether	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Ethylbenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Hexachloroethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Isopropylbenzene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
m,p-Xylene	ND	u	ug/L	5	3	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Methyl tert-Butyl Ether	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Methylene Chloride	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM

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Volatile Organic Compounds

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Nitrobenzene	ND	u	ug/L	10	5	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
o-Xylene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Styrene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Tetrachloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Tetrahydrofuran	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Toluene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
trans-1,2-Dichloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
trans-1,3-Dichloropropene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Trichloroethene	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Trichlorofluoromethane	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Vinyl Acetate	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM
Vinyl chloride	ND	u	ug/L	5	2	SW846-8260 B	04/03/2019 16:52	04/04/2019 16:33	HEM

Surrogate: Bromofluorobenzene 92.4 % 85.1-114.2 04/03/2019 16:52 04/04/2019 16:33 HEM SW846-8260 B

Base Neutral and Acid Extractable Organics

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
1,2,4-Trichlorobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
1,2-Dichlorobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
1,2-Diphenylhydrazine	ND	u	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
1,3-Dichlorobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
1,4-Dichlorobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2,2'-oxybis-(1-Chloropropane)	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2,4,5-Trichlorophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2,4,6-Trichlorophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2,4-Dichlorophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2,4-Dimethylphenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2,4-Dinitrophenol	ND	v7, L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2,4-Dinitrotoluene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2,6-Dinitrotoluene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2-Chloronaphthalene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2-Chlorophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2-Methylnaphthalene	ND	u	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2-Methylphenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2-Nitroaniline	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
2-Nitrophenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
3,3'-Dichlorobenzidine	ND	u	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
3-Nitroaniline	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
4,6-Dinitro-2-methylphenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
4-Bromophenyl-phenylether	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
4-Chloro-3-methylphenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
4-Chloroaniline	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
4-Chlorophenyl-phenylether	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
4-Methylphenol	ND	u	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
4-Nitroaniline	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
4-Nitrophenol	ND	v7, L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Acenaphthene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Acenaphthylene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR

Base Neutral and Acid Extractable Organics

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
alpha-Terpineol	ND	v7, U	ug/L	5		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Anthracene	ND	L2, U	ug/L	15		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Benzidine	ND	U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Benzo(a)anthracene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Benzo(a)pyrene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Benzo(b)fluoranthene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Benzo(g,h,i)perylene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Benzo(k)fluoranthene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Benzoic acid	ND	v7, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Benzyl alcohol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Bis(2-chloroethoxy)methane	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Bis(2-chloroethyl) ether	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Bis(2-ethylhexyl)phthalate	105	J, L2	ug/L	40		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Butylbenzylphthalate	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Carbazole	ND	v7, U	ug/L	11		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Chrysene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Dibenzo(a,h)anthracene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Dibenzofuran	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Diethylphthalate	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Dimethylphthalate	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Di-n-butylphthalate	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Di-n-octylphthalate	ND	L2, v7, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Fluoranthene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Fluorene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Hexachlorobenzene	ND	L2, U	ug/L	13		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Hexachlorobutadiene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Hexachlorocyclopentadiene	ND	L2, v7, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Hexachloroethane	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Indeno(1,2,3-cd)pyrene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Isophorone	ND	U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Naphthalene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Nitrobenzene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
N-Nitrosodimethylamine	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
N-Nitroso-di-n-propylamine	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
N-Nitrosodiphenylamine	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Pentachlorophenol	ND	v7, L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Phenanthrene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Phenol	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Pyrene	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR
Pyridine	ND	L2, U	ug/L	10		SW846-8270 C	04/03/2019 17:00	04/08/2019 16:06	JDR

Surrogate: 2,4,6-Tribromophenol	58.3 %		45-85	04/03/2019 17:00	04/08/2019 16:06	JDR	SW846-8270 C
Surrogate: 2-Fluorobiphenyl	64.0 %		16-99	04/03/2019 17:00	04/08/2019 16:06	JDR	SW846-8270 C
Surrogate: 2-Fluorophenol	39.7 %		30-77	04/03/2019 17:00	04/08/2019 16:06	JDR	SW846-8270 C
Surrogate: Nitrobenzene-d5	59.8 %		25-157	04/03/2019 17:00	04/08/2019 16:06	JDR	SW846-8270 C
Surrogate: Phenol-d6	46.8 %		21-93	04/03/2019 17:00	04/08/2019 16:06	JDR	SW846-8270 C
Surrogate: Terphenyl-d14	73.7 %		30-125	04/03/2019 17:00	04/08/2019 16:06	JDR	SW846-8270 C

Metals by EPA 200 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Aluminum	ND	u, D2	mg/L	0.40	0.14	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Antimony	ND	u	mg/L	0.005	0.002	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 12:06	DMH
Arsenic	ND	D3, U	mg/L	0.0100	0.0020	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Barium	0.043		mg/L	0.004	0.001	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 12:06	DMH
Beryllium	ND	D2, U	mg/L	0.0200	0.0100	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Boron	ND	D2, U	mg/L	1.00	1.00	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:19	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 12:06	DMH
Calcium	203	D1	mg/L	40.0	13.0	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:23	AKB
Chromium	ND	D2, U	mg/L	0.0200	0.0060	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Cobalt	ND	D2, U	mg/L	0.040	0.040	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Copper	ND	D2, U	mg/L	0.030	0.010	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Iron	ND	D2, U	mg/L	1.20	0.500	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:19	AKB
Lead	ND	u	mg/L	0.002	0.0005	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 12:06	DMH
Lithium	0.11	D2, J	mg/L	0.20	0.05	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Magnesium	37.8	D2	mg/L	2.00	0.900	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:19	AKB
Manganese	0.227	D2	mg/L	0.040	0.020	EPA 200.7 REV 4.4	04/05/2019 11:19	04/08/2019 15:19	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 12:06	DMH
Molybdenum	ND	D2, U	mg/L	0.10	0.02	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Nickel	ND	D2, U	mg/L	0.030	0.010	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Potassium	21.1	D2, L1	mg/L	5.00	2.20	EPA 200.7 REV 4.4	04/05/2019 11:19	04/09/2019 11:32	AKB
Selenium	ND	D2, U	mg/L	0.030	0.010	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Silver	ND	u	mg/L	0.0010	0.0004	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 12:06	DMH
Sodium	49.9	D2	mg/L	2.60	1.00	EPA 200.7 REV 4.4	04/05/2019 11:19	04/09/2019 11:32	AKB
Thallium	0.0001	J	mg/L	0.0020	0.0001	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 12:06	DMH
Vanadium	ND	D2, U	mg/L	0.040	0.020	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH
Zinc	ND	D2, U	mg/L	0.20	0.20	EPA 200.8 REV 5.4	04/05/2019 11:19	04/10/2019 20:01	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Specific Conductance (Lab)	1630		umhos/cm	1	1	2510 B-2011	04/04/2019 16:31	04/04/2019 16:31	TLB

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
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Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bromide	ND	u	mg/L	4.0		EPA 300.1	04/15/2019 23:29	04/15/2019 23:29	CSC
Chloride	344	D	mg/L	40.0	25.6	EPA 300.0 REV 2.1	04/04/2019 10:23	04/04/2019 10:23	CSC
Fluoride	ND	M1, u	mg/L	0.2		EPA 300.0 REV 2.1	04/04/2019 10:23	04/04/2019 10:23	CSC
Sulfate	401	D, M1	mg/L	20.0	10.0	EPA 300.0 REV 2.1	04/04/2019 10:23	04/04/2019 10:23	CSC

Notes for work order 9042044

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI does not provide interpretation of these results unless otherwise stated.
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

- D Results reported from dilution.
- D1 Sample required dilution due to high concentration of target analyte.
- D2 Sample required dilution due to matrix interference.
- D3 Sample dilution required due to insufficient sample.
- E Concentration exceeds calibration range
- J Estimated value.
- J5 Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
- L1 The associated blank spike recovery was above method acceptance limits.
- L2 The associated blank spike recovery was below method acceptance limits.
- M1 Matrix spike recovery was high; the method control sample recovery was acceptable.
- M2 Matrix spike recovery was low; the method control sample recovery was acceptable.
- M3 The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
- M4 The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.
- S2 Surrogate recovery was below method acceptance limits.
- U Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
- V7 CCV was below the method control limit for this analyte; however the average % difference or % drift for all the analytes met method criteria.
- Y1 Sample RPD exceeded the method control limit.
- Y2 MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

Standard Qualifiers/Acronyms

- MDL Method Detection Limit
- MRL Minimum Reporting Limit
- ND Not Detected
- LCS Laboratory Control Sample
- MS Matrix Spike
- MSD Matrix Spike Duplicate
- DUP Sample Duplicate
- % Rec Percent Recovery
- RPD Relative Percent Difference
- > Greater than
- < Less than

Certified Analyses included in this Report

Analyte	Certifications
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
2540 C-1997 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
2540 D-2011 in Water	
EPA 200.7 REV 4.4 in Water	
Iron	KY Wastewater Mdv (00030)
EPA 200.8 REV 5.4 in Water	
Mercury	KY Drinking Water Mdv (00030)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
EPA 300.1 in Water	
Bromide	KY Drinking Water Mdv (00030)
SW846-8260 B in Water	
SW846-8270 C in Water	

Sample Acceptance Checklist for Work Order 9042044

Shipped By: Client

Temperature: 0.90° Celcius

Condition

Check if custody seals were present/intact.	<input type="checkbox"/>
Check if any containers were received damaged.	<input type="checkbox"/>
Check if COC was submitted and complete.	<input checked="" type="checkbox"/>
Check if COC agreed with sample labels.	<input checked="" type="checkbox"/>
Check if all containers on COC were received	<input checked="" type="checkbox"/>
Check if all samples had appropriate containers.	<input checked="" type="checkbox"/>
Check if all samples had appropriate volumes.	<input checked="" type="checkbox"/>
Check if collection methods were recorded on COC.	<input checked="" type="checkbox"/>
Check if flow units were recorded on COC.	<input type="checkbox"/>
Check if any headspace issues with volatile sample	<input type="checkbox"/>
Check if holding times were acceptable.	<input checked="" type="checkbox"/>
Check if all containers were preserved properly.	<input checked="" type="checkbox"/>

BIG RIVERS ELECTRIC CORP. CHAIN OF CUSTODY RECORD

No. 1 of 2

Sampling Location: Green Landfill

WO# 9042044

Plant ID. Sample Number	Date Time	Central Lab ID. Sample Number	Station Description	Sampling Method	Sample Size	Type of Preservation	Analysis Requested
-	4/2/2019 3:45 PM	-	"RS1"	G	500 mL	NONE, 4°C	Chloride, Sulfate, Fluoride
-	4/2/2019 3:45 PM	-	"RS1"	G	250 mL	HNO ₃ , 4°C	Total Metals (see attached)
-	4/2/2019 3:45 PM	-	"RS1"	G	250 mL	HNO ₃ , 4°C	Total Metals (see attached)
-	4/2/2019 3:45 PM	-	"RS1"	G	1L	NONE, 4°C	SYOC
-	4/2/2019 3:45 PM	-	"RS1"	G	500 mL	NONE, 4°C	TDS, TSS
-	4/2/2019 3:45 PM	-	"RS1"	G	40 mL	40°C, HCl	VOC
Samplers (Signatures)							
Relinquished By (Signature) <i>Jessie Quick</i>		Date 4/3/2019		Time 12:12		Received By (Signature) <i>[Signature]</i>	
Relinquished By (Signature) <i>Jessie Quick</i>		Date		Time		Received By (Signature)	
Relinquished By (Signature)		Date		Time		Received By (Signature)	
Relinquished By (Signature)		Date		Time		Received By (Signature)	

White Copy - Central Lab
Yellow Copy - Plant (Final Copy)
Pink Copy - Plant Env. Contact
Gold Copy - Plant Lab

0.90

BIG RIVERS ELECTRIC CORP. CHAIN OF CUSTODY RECORD

No. 2 of 2

Sampling Location: Green Landfill

WO # 9042044

Plant ID. Sample Number	Date Time	Central Lab ID. Sample Number	Station Description	Sampling Method	Sample Size	Type of Preservation	Analysis Requested
-	4/2/2019 1343	-	"SW-Culvert - 1"	G	500 ml	NONE, 4°C	Conductivity Bromide, Fluoride, Sulfate, Chloride
-	4/2/2019 1343	-	"SW-Culvert - 1"	G	40 ml	4°C, HCl	VOC
-	4/2/2019 1343	-	"SW-Culvert - 1"	G	1L	4°C	SVOC
-	4/2/2019 1343	-	"SW-Culvert - 1"	G	250 ml	HNO3, 4°C	Total Metals (see attached)
-	4/2/2019 1343	-	"SW-Culvert - 1"	G	250 ml	HNO3, 4°C	Total Metals (see attached)
Samplers (Signatures)							
Relinquished By (Signature) <i>Mess Dick</i>				Time	Received By (Signature)	Date	Time
Relinquished By (Signature) <i>Mess Dick</i>				12:12	<i>[Signature]</i>	4-3-19	12:12
Relinquished By (Signature)				Time	Received By (Signature)	Date	Time
Relinquished By (Signature)				Time	Received By (Signature)	Date	Time
Relinquished By (Signature)				Time	Received By (Signature)	Date	Time

White Copy - Central Lab
Yellow Copy - Plant (Final Copy)
Pink Copy - Plant Env. Contact
Gold Copy - Plant Lab

W011
9042044

Green Landfill -Constituent List

- Antimony
- Aluminum
- Arsenic
- Barium
- Beryllium
- Boron
- Cadmium
- Calcium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Lithium
- Magnesium
- Manganese
- Mercury
- Molybdenum
- Nickel
- Potassium
- Selenium
- Sodium
- Silver
- Thallium
- Vanadium
- Zinc

My Dick
BAEC
4/3/2019
1212

ANALYTICAL REPORT

Eurofins TestAmerica, Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

Laboratory Job ID: 490-172013-1
Laboratory Sample Delivery Group: Sebree Station
Client Project/Site: Sebree Station

For:
Big Rivers Electric Corporation
PO BOX 24
Henderson, Kentucky 42419

Attn: Mark Bertram

Roxanne Cisneros

Authorized for release by:
4/24/2019 3:38:21 PM

Roxanne Cisneros, Senior Project Manager
(615)301-5761
roxanne.cisneros@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



Table of Contents

Cover Page	1
Table of Contents	2
Sample Summary	3
Case Narrative	4
Definitions	5
Client Sample Results	6
QC Sample Results	7
QC Association	12
Chronicle	14
Method Summary	15
Certification Summary	16
Chain of Custody	17
Receipt Checklists	23

Sample Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-172013-1	023	Water	04/11/19 11:25	04/12/19 09:55

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Case Narrative

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Job ID: 490-172013-1

Laboratory: Eurofins TestAmerica, Nashville

Narrative

Job Narrative 490-172013-1

Comments

No additional comments.

Receipt

The sample was received on 4/12/2019 9:55 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.6° C.

HPLC/IC

Method(s) 9056A: The following sample was diluted due to the nature of the sample matrix: 023 (490-172013-1). Elevated reporting limits (RLs) are provided.

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

Metals

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

General Chemistry

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

Organic Prep

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



Definitions/Glossary

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Client Sample ID: 023

Lab Sample ID: 490-172013-1

Date Collected: 04/11/19 11:25

Matrix: Water

Date Received: 04/12/19 09:55

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	864		600	40.0	mg/L			04/16/19 12:06	200
Fluoride	0.0356	J	1.00	0.0100	mg/L			04/15/19 15:10	1
Sulfate	548	B	100	0.600	mg/L			04/16/19 11:33	20

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.766		0.0500	0.00959	mg/L		04/16/19 11:19	04/22/19 16:56	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0000690	J B	0.00200	0.0000213	mg/L		04/16/19 11:17	04/17/19 11:26	1
Arsenic	0.000759	J	0.00500	0.000118	mg/L		04/16/19 11:17	04/17/19 11:26	1
Barium	0.0557	J B	0.200	0.000270	mg/L		04/16/19 11:17	04/17/19 11:26	1
Beryllium	ND		0.00200	0.000102	mg/L		04/16/19 11:17	04/17/19 11:26	1
Boron	0.626	J B	1.00	0.00339	mg/L		04/16/19 11:17	04/17/19 11:26	1
Cadmium	0.000411	J	0.00100	0.000152	mg/L		04/16/19 11:17	04/17/19 11:26	1
Calcium	488		1.00	0.0412	mg/L		04/16/19 11:17	04/17/19 11:26	1
Chromium	0.00281	J	0.00300	0.000339	mg/L		04/16/19 11:17	04/17/19 11:26	1
Cobalt	0.000450	J	0.00500	0.0000218	mg/L		04/16/19 11:17	04/17/19 11:26	1
Lead	0.000140	J	0.00500	0.0000675	mg/L		04/16/19 11:17	04/17/19 11:26	1
Molybdenum	0.0110		0.0100	0.000873	mg/L		04/16/19 11:17	04/17/19 11:26	1
Potassium	69300		1000	147	ug/L		04/16/19 11:17	04/17/19 11:26	1
Selenium	ND		0.0100	0.000348	mg/L		04/16/19 11:17	04/17/19 11:26	1
Thallium	0.0000670	J	0.00100	0.0000360	mg/L		04/16/19 11:17	04/17/19 11:26	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.000100	mg/L		04/18/19 12:23	04/18/19 17:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.13		0.100	0.100	SU			04/18/19 18:32	1
Temperature	22.8		0.100	0.100	Degrees C			04/18/19 18:32	1
Total Dissolved Solids	2850		100	28.0	mg/L			04/15/19 16:11	1

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 490-588042/3
Matrix: Water
Analysis Batch: 588042

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	0.200	mg/L			04/15/19 11:18	1
Fluoride	ND		1.00	0.0100	mg/L			04/15/19 11:18	1
Sulfate	0.2213	J	5.00	0.0300	mg/L			04/15/19 11:18	1

Lab Sample ID: LCS 490-588042/4
Matrix: Water
Analysis Batch: 588042

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.265		mg/L		93	80 - 120
Fluoride	1.00	0.9279	J	mg/L		93	80 - 120
Sulfate	10.0	9.611		mg/L		96	80 - 120

Lab Sample ID: LCSD 490-588042/5
Matrix: Water
Analysis Batch: 588042

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.373		mg/L		94	80 - 120	1	20
Fluoride	1.00	0.9700	J	mg/L		97	80 - 120	4	20
Sulfate	10.0	9.661		mg/L		96	80 - 120	1	20

Lab Sample ID: 490-172052-B-1 MS
Matrix: Water
Analysis Batch: 588042

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.12	J	10.0	14.02		mg/L		119	80 - 120
Fluoride	0.0156	J F1	1.00	1.417	F1	mg/L		140	80 - 120
Sulfate	0.601	J B F1	10.0	13.20	F1	mg/L		126	80 - 120

Lab Sample ID: 490-172052-B-1 MSD
Matrix: Water
Analysis Batch: 588042

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2.12	J	10.0	13.02		mg/L		109	80 - 120	7	20
Fluoride	0.0156	J F1	1.00	1.338	F1	mg/L		132	80 - 120	6	20
Sulfate	0.601	J B F1	10.0	12.63		mg/L		120	80 - 120	4	20

Lab Sample ID: MB 490-588250/3
Matrix: Water
Analysis Batch: 588250

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	0.200	mg/L			04/16/19 10:10	1
Fluoride	ND		1.00	0.0100	mg/L			04/16/19 10:10	1
Sulfate	0.2110	J	5.00	0.0300	mg/L			04/16/19 10:10	1

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-588250/4
Matrix: Water
Analysis Batch: 588250

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.351		mg/L		93	80 - 120
Fluoride	1.00	0.9880	J	mg/L		99	80 - 120
Sulfate	10.0	9.710		mg/L		97	80 - 120

Lab Sample ID: LCSD 490-588250/5
Matrix: Water
Analysis Batch: 588250

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.359		mg/L		93	80 - 120	0	20
Fluoride	1.00	0.9895	J	mg/L		99	80 - 120	0	20
Sulfate	10.0	9.756		mg/L		97	80 - 120	0	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 180-275853/1-A
Matrix: Water
Analysis Batch: 276485

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 275853

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		04/16/19 11:19	04/22/19 15:56	1

Lab Sample ID: LCS 180-275853/2-A
Matrix: Water
Analysis Batch: 276485

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 275853

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	1.00	1.006		mg/L		101	80 - 120

Lab Sample ID: 490-172010-A-3-C MS
Matrix: Water
Analysis Batch: 276485

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 275853

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	0.0313	J	1.00	1.065		mg/L		103	75 - 125

Lab Sample ID: 490-172010-A-3-D MSD
Matrix: Water
Analysis Batch: 276485

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 275853

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Lithium	0.0313	J	1.00	1.090		mg/L		106	75 - 125	2	20

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-275852/1-A
Matrix: Water
Analysis Batch: 276092

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 275852

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00002800	J	0.00200	0.0000213	mg/L		04/16/19 11:17	04/17/19 11:54	1
Arsenic	ND		0.00500	0.000118	mg/L		04/16/19 11:17	04/17/19 11:54	1
Barium	0.0007190	J	0.200	0.000270	mg/L		04/16/19 11:17	04/17/19 11:54	1
Beryllium	ND		0.00200	0.000102	mg/L		04/16/19 11:17	04/17/19 11:54	1
Boron	0.02478	J	1.00	0.00339	mg/L		04/16/19 11:17	04/17/19 11:54	1
Cadmium	ND		0.00100	0.000152	mg/L		04/16/19 11:17	04/17/19 11:54	1
Calcium	ND		1.00	0.0412	mg/L		04/16/19 11:17	04/17/19 11:54	1
Chromium	ND		0.00300	0.000339	mg/L		04/16/19 11:17	04/17/19 11:54	1
Cobalt	ND		0.00500	0.0000218	mg/L		04/16/19 11:17	04/17/19 11:54	1
Lead	ND		0.00500	0.0000675	mg/L		04/16/19 11:17	04/17/19 11:54	1
Molybdenum	ND		0.0100	0.000873	mg/L		04/16/19 11:17	04/17/19 11:54	1
Potassium	ND		1000	147	ug/L		04/16/19 11:17	04/17/19 11:54	1
Selenium	ND		0.0100	0.000348	mg/L		04/16/19 11:17	04/17/19 11:54	1
Thallium	ND		0.00100	0.0000360	mg/L		04/16/19 11:17	04/17/19 11:54	1

Lab Sample ID: LCS 180-275852/2-A
Matrix: Water
Analysis Batch: 276092

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 275852

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.500	0.5151		mg/L		103	80 - 120
Arsenic	0.0400	0.03629		mg/L		91	80 - 120
Barium	2.00	2.120		mg/L		106	80 - 120
Beryllium	0.0500	0.05131		mg/L		103	80 - 120
Boron	1.00	1.006		mg/L		101	80 - 120
Cadmium	0.0500	0.05263		mg/L		105	80 - 120
Calcium	50.0	50.60		mg/L		101	80 - 120
Chromium	0.200	0.2148		mg/L		107	80 - 120
Cobalt	0.500	0.4481		mg/L		90	80 - 120
Lead	0.0200	0.02088		mg/L		104	80 - 120
Molybdenum	1.00	0.9910		mg/L		99	80 - 120
Potassium	50000	48340		ug/L		97	80 - 120
Selenium	0.0100	0.01029		mg/L		103	80 - 120
Thallium	0.0500	0.05310		mg/L		106	80 - 120

Lab Sample ID: 490-172010-A-1-B MS
Matrix: Water
Analysis Batch: 276092

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 275852

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Antimony	0.000119	J B	0.500	0.5292		mg/L		106	75 - 125
Arsenic	0.00208	J	0.0400	0.03945		mg/L		93	75 - 125
Barium	0.0216	J B	2.00	2.197		mg/L		109	75 - 125
Beryllium	ND		0.0500	0.05176		mg/L		104	75 - 125
Boron	0.271	J B	1.00	1.297		mg/L		103	75 - 125
Cadmium	ND		0.0500	0.05279		mg/L		106	75 - 125
Calcium	502		50.0	557.9	4	mg/L		111	75 - 125
Chromium	0.00360		0.200	0.2213		mg/L		109	75 - 125
Cobalt	0.00522		0.500	0.4645		mg/L		92	75 - 125

Eurofins TestAmerica, Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

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

Lab Sample ID: 490-172010-A-1-B MS
Matrix: Water
Analysis Batch: 276092

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 275852

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lead	0.000233	J	0.0200	0.02146		mg/L		106	75 - 125
Molybdenum	0.00104	J	1.00	1.043		mg/L		104	75 - 125
Potassium	1660		50000	48970		ug/L		95	75 - 125
Selenium	ND		0.0100	0.01059		mg/L		106	75 - 125
Thallium	ND		0.0500	0.05541		mg/L		111	75 - 125

Lab Sample ID: 490-172010-A-1-C MSD
Matrix: Water
Analysis Batch: 276092

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 275852

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	0.000119	J B	0.500	0.5401		mg/L		108	75 - 125	2	20
Arsenic	0.00208	J	0.0400	0.03954		mg/L		94	75 - 125	0	20
Barium	0.0216	J B	2.00	2.231		mg/L		110	75 - 125	2	20
Beryllium	ND		0.0500	0.05116		mg/L		102	75 - 125	1	20
Boron	0.271	J B	1.00	1.238		mg/L		97	75 - 125	5	20
Cadmium	ND		0.0500	0.05362		mg/L		107	75 - 125	2	20
Calcium	502		50.0	566.9	4	mg/L		129	75 - 125	2	20
Chromium	0.00360		0.200	0.2201		mg/L		108	75 - 125	1	20
Cobalt	0.00522		0.500	0.4630		mg/L		92	75 - 125	0	20
Lead	0.000233	J	0.0200	0.02185		mg/L		108	75 - 125	2	20
Molybdenum	0.00104	J	1.00	1.061		mg/L		106	75 - 125	2	20
Potassium	1660		50000	50080		ug/L		97	75 - 125	2	20
Selenium	ND		0.0100	0.01045		mg/L		105	75 - 125	1	20
Thallium	ND		0.0500	0.05523		mg/L		110	75 - 125	0	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 490-588899/1-A
Matrix: Water
Analysis Batch: 589024

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 588899

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.000100	mg/L		04/18/19 12:23	04/18/19 17:25	1

Lab Sample ID: LCS 490-588899/2-A
Matrix: Water
Analysis Batch: 589024

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 588899

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.00100	0.001058		mg/L		106	80 - 120

Lab Sample ID: 490-172013-1 MS
Matrix: Water
Analysis Batch: 589024

Client Sample ID: 023
Prep Type: Total/NA
Prep Batch: 588899

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		0.00100	0.001196		mg/L		120	75 - 125

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 490-172013-1 MSD
Matrix: Water
Analysis Batch: 589024

Client Sample ID: 023
Prep Type: Total/NA
Prep Batch: 588899

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		0.00100	0.001191		mg/L		119	75 - 125	0	20

Method: 9040C - pH

Lab Sample ID: LCS 490-589003/1
Matrix: Water
Analysis Batch: 589003

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.040		SU		101	98 - 103

Lab Sample ID: 490-171598-A-10 DU
Matrix: Water
Analysis Batch: 589003

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.94		6.940		SU		0	20
Temperature	23.0		23.00		Degrees C		0	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 490-586704/1
Matrix: Water
Analysis Batch: 586704

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		2.50	0.700	mg/L			04/15/19 16:11	1

Lab Sample ID: LCS 490-586704/2
Matrix: Water
Analysis Batch: 586704

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	10.0	9.800		mg/L		98	90 - 110

Lab Sample ID: 490-172007-E-1 DU
Matrix: Water
Analysis Batch: 586704

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	3370		3384		mg/L		0.4	20

Lab Sample ID: 490-172013-1 DU
Matrix: Water
Analysis Batch: 586704

Client Sample ID: 023
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	2850		2772		mg/L		3	20

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

HPLC/IC

Analysis Batch: 588042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total/NA	Water	9056A	
MB 490-588042/3	Method Blank	Total/NA	Water	9056A	
LCS 490-588042/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 490-588042/5	Lab Control Sample Dup	Total/NA	Water	9056A	
490-172052-B-1 MS	Matrix Spike	Total/NA	Water	9056A	
490-172052-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	9056A	

Analysis Batch: 588250

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total/NA	Water	9056A	
490-172013-1	023	Total/NA	Water	9056A	
MB 490-588250/3	Method Blank	Total/NA	Water	9056A	
LCS 490-588250/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 490-588250/5	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 275852

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total Recoverable	Water	3005A	
MB 180-275852/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-275852/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
490-172010-A-1-B MS	Matrix Spike	Total Recoverable	Water	3005A	
490-172010-A-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Prep Batch: 275853

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total Recoverable	Water	3005A	
MB 180-275853/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-275853/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
490-172010-A-3-C MS	Matrix Spike	Total Recoverable	Water	3005A	
490-172010-A-3-D MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Analysis Batch: 276092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total Recoverable	Water	6020A	275852
MB 180-275852/1-A	Method Blank	Total Recoverable	Water	6020A	275852
LCS 180-275852/2-A	Lab Control Sample	Total Recoverable	Water	6020A	275852
490-172010-A-1-B MS	Matrix Spike	Total Recoverable	Water	6020A	275852
490-172010-A-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020A	275852

Analysis Batch: 276485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total Recoverable	Water	6010C	275853
MB 180-275853/1-A	Method Blank	Total Recoverable	Water	6010C	275853
LCS 180-275853/2-A	Lab Control Sample	Total Recoverable	Water	6010C	275853
490-172010-A-3-C MS	Matrix Spike	Total Recoverable	Water	6010C	275853
490-172010-A-3-D MSD	Matrix Spike Duplicate	Total Recoverable	Water	6010C	275853

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Metals

Prep Batch: 588899

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total/NA	Water	7470A	
MB 490-588899/1-A	Method Blank	Total/NA	Water	7470A	
LCS 490-588899/2-A	Lab Control Sample	Total/NA	Water	7470A	
490-172013-1 MS	023	Total/NA	Water	7470A	
490-172013-1 MSD	023	Total/NA	Water	7470A	

Analysis Batch: 589024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total/NA	Water	7470A	588899
MB 490-588899/1-A	Method Blank	Total/NA	Water	7470A	588899
LCS 490-588899/2-A	Lab Control Sample	Total/NA	Water	7470A	588899
490-172013-1 MS	023	Total/NA	Water	7470A	588899
490-172013-1 MSD	023	Total/NA	Water	7470A	588899

General Chemistry

Analysis Batch: 586704

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total/NA	Water	SM 2540C	
MB 490-586704/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 490-586704/2	Lab Control Sample	Total/NA	Water	SM 2540C	
490-172007-E-1 DU	Duplicate	Total/NA	Water	SM 2540C	
490-172013-1 DU	023	Total/NA	Water	SM 2540C	

Analysis Batch: 589003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-172013-1	023	Total/NA	Water	9040C	
LCS 490-589003/1	Lab Control Sample	Total/NA	Water	9040C	
490-171598-A-10 DU	Duplicate	Total/NA	Water	9040C	

Lab Chronicle

Client: Big Rivers Electric Corporation
 Project/Site: Sebree Station

Job ID: 490-172013-1
 SDG: Sebree Station

Client Sample ID: 023

Lab Sample ID: 490-172013-1

Date Collected: 04/11/19 11:25

Matrix: Water

Date Received: 04/12/19 09:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			588042	04/15/19 15:10	SOO	TAL NSH
Total/NA	Analysis	9056A		20			588250	04/16/19 11:33	SOO	TAL NSH
Total/NA	Analysis	9056A		200			588250	04/16/19 12:06	SOO	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	275853	04/16/19 11:19	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			276485	04/22/19 16:56	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	275852	04/16/19 11:17	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			276092	04/17/19 11:26	RSK	TAL PIT
Total/NA	Prep	7470A			30 mL	30 mL	588899	04/18/19 12:23	CSL	TAL NSH
Total/NA	Analysis	7470A		1			589024	04/18/19 17:30	EHS	TAL NSH
Total/NA	Analysis	9040C		1			589003	04/18/19 18:32	MXX	TAL NSH
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	586704	04/15/19 16:11	BMC	TAL NSH

Laboratory References:

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Method Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree Station

Job ID: 490-172013-1
SDG: Sebree Station

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL NSH
6010C	Metals (ICP)	SW846	TAL PIT
6020A	Metals (ICP/MS)	SW846	TAL PIT
7470A	Mercury (CVAA)	SW846	TAL NSH
9040C	pH	SW846	TAL NSH
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL NSH
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL NSH

Protocol References:

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

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

Laboratory References:

TAL NSH = Eurofins TestAmerica, Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Accreditation/Certification Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree Station

Job ID: 490-172013-1
 SDG: Sebree Station

Laboratory: Eurofins TestAmerica, Nashville

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kentucky (UST)	State Program	4	19	06-30-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9040C		Water	pH
9040C		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate
SM 2540C		Water	Total Dissolved Solids

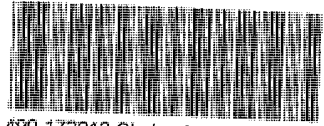
Laboratory: Eurofins TestAmerica, Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-19
California	State Program	9	2891	04-30-19 *
Connecticut	State Program	1	PH-0688	09-30-20
Florida	NELAP	4	E871008	06-30-19
Illinois	NELAP	5	200005	06-30-19
Kansas	NELAP	7	E-10350	01-31-20
Louisiana	NELAP	6	04041	06-30-19
Nevada	State Program	9	PA00164	07-31-19
New Hampshire	NELAP	1	2030	04-04-20
New Jersey	NELAP	2	PA005	06-30-19
New York	NELAP	2	11182	03-31-20
North Carolina (WW/SW)	State Program	4	434	12-31-19
Oregon	NELAP	10	PA-2151	02-06-20
Pennsylvania	NELAP	3	02-00416	04-30-19
South Carolina	State Program	4	89014	04-30-19 *
Texas	NELAP	6	T104704528-15-2	03-31-20
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-19 *
Virginia	NELAP	3	460189	09-14-19
West Virginia DEP	State Program	3	142	01-31-20
Wisconsin	State Program	5	998027800	08-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

COOLER RECEIPT FORM



490-172013 Chain of Custody

Cooler Received/Opened On 4/12/2019 @ 0955

Time Samples Removed From Cooler 14:50 Time Samples Placed In Storage 14:55 (2 Hour Window)

1. Tracking # 1625 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID 17960357 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 0.6 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) GH

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry Ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) ACE

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) ACE

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) ACE

I certify that I attached a label with the unique LIMS number to each container (initial) ACE

21. Were there Non-Conformance issues at login? YES...NO...# _____ Was a NCM generated? YES...NO...# _____

Chain of Custody Record 299400



THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
 TAL-8210 (0719)

Regulatory Program: DW NPDES RCRA Other:

Client Contact Company Name: <i>Big Rivers Electric Corp</i> Address: <i>9000 Highway 2096</i> City/State/Zip: <i>Rebards, KY 42452</i> Phone: <i>(270) 844-5736</i> Fax: Project Name: <i>Sebec Station</i> Site: <i>Sebec Station</i> P O #: <i>249349</i>		Project Manager: Mark Bertram Tel/Fax: <i>(270) 844-5708</i> Analysis Turnaround Time <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Site Contact: Greg Dick Date: <i>4/11/2019</i> Lab Contact: Roxanne Cisneros Carrier: <i>FedEx</i> COC No: <i>299400</i> 1 of 1 COCs Sampler: For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.:	
Sample Identification 023		Filtered Sample (Y/N) <i>M</i> Perform MS/MSD (Y/N) <i>M</i> 403.0, 904.0 44704, 60204, 60104 90564, 08674, 200, 90404 25404, 044, 705		Sample Specific Notes: Loc: 490 172013	
Sample Date: <i>4/11/2019</i> 11:25 Sample Time: <i>11:25</i> Sample Type (C=Comp, G=Grab): <i>G</i> Matrix: <i>Water</i> # of Cont.: <i>6</i>		Preservation Used: 1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.		Return to Client <input type="checkbox"/> Disposal by Lab <input checked="" type="checkbox"/> Archive for _____ Months	
Special Instructions/QC Requirements & Comments: <i>Run analysis per 40 CFR 257 Appendix III & Appendix IV parameters. See attached constituent list for analysis.</i>					
Relinquished by: <i>Greg Dick</i> Date/Time: <i>4/11/2019 1605</i>		Received by: Date/Time:		Custody Seal No.: Company: <i>BREC</i>	
Relinquished by: Date/Time:		Received in Laboratory by: Date/Time: <i>4/13/19 9:55</i>		Cooler Temp. (°C): <i>20</i> Corrid:	



4/11/2019

Constituent List:

40 C.F.R. 257 Appendix III

Boron
Calcium
Fluoride
pH
Sulfate
Total Dissolved Solids (TDS)

40 C.F.R. 257 Appendix IV

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 & 228 combined

Mary Dine
PREC
4/11/2019
1605

Loc: 490
172013



SDR

Ex Saturday Delivery

151967 REV 7/08 RRD

estAmerica

THE LEADER IN ENVIRONMENTAL TESTING

4 ID:RNCA (615) 726-0177
ING MGR
INS TESTAMERICA
OSTER CREIGHTON

SHIP DATE: 12APR19
ACTWGT: 10.00 LB MAN
CAD: 820425/CAFE3211

LE, TN 37204
STATES US

BILL RECIPIENT

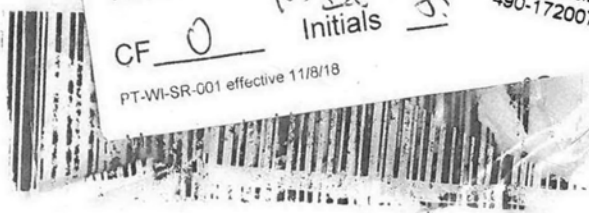
PPING/RECEIVING
TAMERICA LABORATORIES, INC.
ALPHA DRIVE
C PARK
TTSBURGH PA 15238
7058 REF: S490-99035



PO 8844 2647 SATURDAY 12:00P
PRIORITY OVERNIGHT

AGCA

Uncorrected temp 15.7
Thermometer ID 10
No Ice Initials JT



RF 639
SF 3

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Chain of Custody Record



Client Information (Sub Contract Lab)			Lab PM: Cisneros, Roxanne			Carrier Tracking No(s): COC No: 490-88697-1		
Client Contact: Shipping/Receiving			E-Mail: roxanne.cisneros@tesamericainc.com			Page: Page 1 of 1		
Company: TestAmerica Laboratories, Inc.			Accreditations Required (See note): State Program - Kentucky (UST)			Job #: 490-172013-1		
Address: 301 Alpha Drive, RIDC Park, Pittsburgh, PA, 15238			Due Date Requested: 4/24/2019			Preservation Codes:		
Phone: 412-963-7058(Tel) 412-963-2468(Fax)			TAT Requested (days):			A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:		
Email:			PO #:			M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)		
Project Name: Seebree Station			WO #:			Total Number of Containers		
Site: Big Rivers CCR			Project #: 49010431			1		
SSOW#:			SOW#:			Special Instructions/Note:		
Sample Identification - Client ID (Lab ID)			Sample Date			Metals - run once, upload together.		
023 (490-172013-1)			4/11/19			490-172013 Chain of Custody		
Sample Time			Sample Time			Field Filtered Sample (Yes or No)		
11:25 Eastern			11:25 Eastern			Perform MS/MSD (Yes or No)		
Sample Type (C=Comp, G=grab)			Sample Time			6010C/3005A (MOD) Lithium		
Matrix (W=water, S=solid, O=wastefoil, BT=Tissue, A=Air)			Sample Date			6020A/3005A (MOD) ICP/MS Metals		
Water			4/11/19			Analysis Requested		
Preservation Code			Sample Date			Analysis Requested		
Water			4/11/19			Analysis Requested		

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
 Unconfirmed
 Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2
 Empty Kit Relinquished by: _____ Date: _____
 Relinquished by: *[Signature]* Date/Time: 4-12-19 16:15 Company: *[Signature]* Company: _____
 Relinquished by: _____ Date/Time: _____ Company: _____
 Relinquished by: _____ Date/Time: _____ Company: _____
 Custody Seals Intact: _____ Custody Seal No.: _____
 Δ Yes Δ No
 Cooler Temperature(s) °C and Other Remarks:

Chain of Custody Record



Client Information (Sub Contract Lab)		Lab PM: Cisneros, Roxanne	Carrier Tracking No(s):	COC No: 490-88697.1
Shipping/Receiving		E-Mail: roxanne.cisneros@testamericainc.com	State of Origin: Kentucky	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Kentucky (UST)		
Address: 301 Alpha Drive, RIDC Park,		Job #: 490-172013-1		
City: Pittsburgh	Analysis Requested			
State, Zip: PA, 15238	Analysis Requested			
Phone: 412-963-7058(Tel) 412-963-2468(Fax)	Analysis Requested			
Email:	Analysis Requested			
Project Name: Seebree Station	Analysis Requested			
Site: Big Rivers CCR	Analysis Requested			
Due Date Requested: 4/24/2019		Total Number of Containers: 1		
TAT Requested (days):		Special Instructions/Note: Metals - run once, upload together.		
PO #:	Sample Date: 4/11/19	Sample Time: 11:25 Eastern	Sample Type (C=comp, G=grab):	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)
WO #:	Sample Date: 4/11/19	Sample Time: 11:25 Eastern	Sample Type (C=comp, G=grab):	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)
Project #: 49010431	Field Filtered Sample (Yes or No):	Perform MS/MSD (Yes or No):	6010C/3005A (MOD) Lithium	6020A/3005A (MOD) ICP/MS Metals
SSOW#:	Field Filtered Sample (Yes or No):	Perform MS/MSD (Yes or No):	6010C/3005A (MOD) Lithium	6020A/3005A (MOD) ICP/MS Metals
Sample Identification - Client ID (Lab ID)		Sample Identification - Client ID (Lab ID)		
023 (490-172013-1)	<p>490-172013 Chain of Custody</p>			
<p>Possible Hazard Identification</p> <p>Unconfirmed</p> <p>Deliverable Requested: I, II, III, IV, Other (specify)</p> <p>Primary Deliverable Rank: 2</p>				
<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</p> <p><input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p> <p>Special Instructions/QC Requirements:</p>				
<p>Empty Kit Relinquished by:</p> <p>Relinquished by: <i>[Signature]</i> Date: 4-12-19 10:15</p> <p>Relinquished by: <i>[Signature]</i> Date/Time: _____ Company: <i>[Signature]</i></p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Custody Seals Intact: _____ Custody Seal No.: _____</p> <p>Δ Yes Δ No</p>				
<p>Method of Shipment: _____</p> <p>Received by: <i>[Signature]</i> Date/Time: 4-13-19 Company: <i>[Signature]</i></p> <p>Received by: <i>[Signature]</i> Date/Time: 9:30 Company: _____</p> <p>Received by: _____ Date/Time: _____ Company: _____</p> <p>Cooler Temperature(s) °C and Other Remarks:</p>				



Login Sample Receipt Checklist

Client: Big Rivers Electric Corporation

Job Number: 490-172013-1
SDG Number: Sebree Station

Login Number: 172013

List Number: 2

Creator: Watson, Debbie

List Source: Eurofins TestAmerica, Pittsburgh

List Creation: 04/13/19 01:27 PM

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



Appendix D

Landfill Perimeter Seeps Laboratory Analytical Results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-155661-1
Client Project/Site: Sebree-Green Landfill

For:
Big Rivers Electric Corporation
PO BOX 24
Henderson, Kentucky 42419

Attn: Greg Dick

Roxanne Cisneros

Authorized for release by:
8/21/2018 10:53:38 AM

Roxanne Cisneros, Senior Project Manager
(615)301-5761
roxanne.cisneros@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



Table of Contents

Cover Page	1
Table of Contents	2
Sample Summary	3
Case Narrative	4
Definitions	7
Client Sample Results	8
QC Sample Results	32
QC Association	43
Chronicle	49
Method Summary	56
Certification Summary	57
Chain of Custody	59
Receipt Checklists	66
Tracer Carrier Summary	67

Sample Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-155661-1	River Seep-08-071318	Water	07/13/18 07:50	07/14/18 10:50
490-155661-2	River Seep-12-071318	Water	07/13/18 09:15	07/14/18 10:50
490-155661-3	River Seep-16-071318	Water	07/13/18 11:00	07/14/18 10:50
490-155661-4	River Seep-14-071318	Water	07/13/18 10:10	07/14/18 10:50
490-155661-5	River Seep-09-071218	Water	07/12/18 13:50	07/14/18 10:50
490-155661-6	River Seep-07-071218	Water	07/12/18 14:50	07/14/18 10:50
490-155661-7	River Seep-05-071218	Water	07/12/18 14:25	07/14/18 10:50
490-155661-8	Landfill Seep-01-071318	Water	07/13/18 12:20	07/14/18 10:50
490-155661-9	Landfill Seep-01-071318-DUP	Water	07/13/18 12:20	07/14/18 10:50
490-155661-10	Landfill Seep-02-071318	Water	07/13/18 13:10	07/14/18 10:50
490-155661-11	Landfill Seep-03-071318	Water	07/13/18 13:30	07/14/18 10:50
490-155661-12	Pond-012-071318	Water	07/13/18 13:50	07/14/18 10:50
490-155661-13	Landfill Seep-04-071318	Water	07/13/18 14:15	07/14/18 10:50

Case Narrative

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Job ID: 490-155661-1

Laboratory: TestAmerica Nashville

Narrative

**Job Narrative
490-155661-1**

Comments

Revised Report 8/10/2018 to add Potassium per client request.

Receipt

The samples were received on 7/14/2018 10:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.0° C, 3.1° C and 5.7° C.

HPLC/IC

Method(s) 9056A: The method blank for analytical batch 490-531256 contained Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method(s) 9056A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 490-531256 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 9056A: The method blank for analytical batch 490-531256 contained Fluoride and Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method(s) 9056A: The following samples were diluted due to the nature of the sample matrix: River Seep-08-071318 (490-155661-1), River Seep-14-071318 (490-155661-4), River Seep-09-071218 (490-155661-5), River Seep-07-071218 (490-155661-6), River Seep-05-071218 (490-155661-7), Landfill Seep-01-071318 (490-155661-8), Landfill Seep-01-071318-DUP (490-155661-9), Landfill Seep-02-071318 (490-155661-10), Landfill Seep-03-071318 (490-155661-11), Pond-012-071318 (490-155661-12) and Landfill Seep-04-071318 (490-155661-13). Elevated reporting limits (RLs) are provided.

Method(s) 9056A: The method blank as well as the continuing calibration blanks for analytical batch 490-531368 contained sulfate above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

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

Metals

Method(s) 6020A: The following samples were diluted to bring the concentration of calcium within the linear range: Landfill Seep-03-071318 (490-155661-11) and Landfill Seep-04-071318 (490-155661-13). Elevated reporting limits (RLs) are provided.

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

General Chemistry

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

Organic Prep

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

Narrative

**Job Narrative
490-155661-2**

Comments

No additional comments.

Receipt

The samples were received on 7/14/2018 10:50 AM; the samples arrived in good condition, properly preserved and, where required, on

Case Narrative

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Job ID: 490-155661-1 (Continued)

Laboratory: TestAmerica Nashville (Continued)

ice. The temperatures of the 3 coolers at receipt time were 1.0° C, 3.1° C and 5.7° C.

RAD

Method(s) 904.0: Ra-228 Prep Batch 160-376750: The following sample did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interferences (see prep NCM 160-144167). The sample was brown, opaque and contained heavy amounts of sediment. The data have been reported with this narrative. River Seep-05-071218 (490-155661-7)

Method(s) 904.0: Radium-228 Prep Batch 260-377705: The detection goal was not met for the following samples due to the presence of matrix interferences: Landfill Seep-03-071318 (490-155661-11). The samples were reduced due to potential matrix interferences. Sample 440-216184-1 was brown, opaque and contained floating debris. Sample 490-155661-11's crystallized precipitation interferes with the method's chemistry. Analytical results are reported with the detection limit achieved.

Method(s) PrecSep_0: Radium 228 Prep Batch 160-376750:

Sample aliquot 490-155661-2 reduced due to potential matrix interference. Sample was yellow, murky, and contained heavy amounts of sediment.

Sample aliquots 490-155661-5 and 490-155661-7 reduced due to potential matrix interference. Samples were brown, opaque, and contained heavy amounts of sediment.

Sample aliquot 490-155661-8 reduced due to potential matrix interference. Samples were yellow, opaque, and had a strong odor similar to that of sulfur.

River Seep-12-071318 (490-155661-2), River Seep-09-071218 (490-155661-5), River Seep-05-071218 (490-155661-7) and Landfill Seep-01-071318 (490-155661-8)

Method(s) PrecSep_0: Radium 228 Prep Batch 160-376750: Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: River Seep-08-071318 (490-155661-1), River Seep-12-071318 (490-155661-2), River Seep-09-071218 (490-155661-5), River Seep-07-071218 (490-155661-6), River Seep-05-071218 (490-155661-7) and Landfill Seep-01-071318 (490-155661-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep_0: Radium 228 Prep Batch 160-376805:

Sample aliquots 490-155661-9, 490-155661-12, and 490-155661-13 reduced due to potential matrix interference. Samples were yellow, opaque, and had strong odors similar to that of sulfur.

Sample aliquot 490-155661-10 reduced due to potential matrix interference. Sample was brown, opaque, and contained heavy sediment levels.

Sample aliquot 160-29589-1 reduced due to potential matrix interference. Samples were brown, murky, and contained floating debris.

Landfill Seep-01-071318-DUP (490-155661-9), Landfill Seep-02-071318 (490-155661-10), Pond-012-071318 (490-155661-12) and Landfill Seep-04-071318 (490-155661-13)

Method(s) PrecSep_0: Radium 228 Prep Batch 160-377705:

Sample aliquot reduced due to matrix interference during the initial preparation of the sample. Crystallized precipitation interferes with chemistry of the method. Landfill Seep-03-071318 (490-155661-11)

Method(s) PrecSep-21: Radium 226 Prep Batch 160-376745: Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: River Seep-08-071318 (490-155661-1), River Seep-12-071318 (490-155661-2), River Seep-09-071218 (490-155661-5), River Seep-07-071218 (490-155661-6), River Seep-05-071218 (490-155661-7) and Landfill Seep-01-071318 (490-155661-8). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep-21: Radium 226 Prep Batch 160-376745:

Case Narrative

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Job ID: 490-155661-1 (Continued)

Laboratory: TestAmerica Nashville (Continued)

Sample aliquot 490-155661-2 reduced due to potential matrix interference. Sample was yellow, murky, and contained heavy amounts of sediment.

Sample aliquots 490-155661-5 and 490-155661-7 reduced due to potential matrix interference. Samples were brown, opaque, and contained heavy amounts of sediment.

Sample aliquot 490-155661-8 reduced due to potential matrix interference. Samples were yellow, opaque, and had a strong odor similar to that of sulfur.

Method(s) PrecSep-21: Radium 226 Prep Batch 160-376796:

Sample aliquots 490-155661-9, 490-155661-12, and 490-155661-13 reduced due to potential matrix interference. Samples were yellow, opaque, and had strong odors similar to that of sulfur.

Sample aliquots 490-155661-10 and 160-29566-2 reduced due to potential matrix interference. Samples were brown, opaque, and contained heavy sediment levels.

Sample aliquot 160-29589-1 reduced due to potential matrix interference. Samples were brown, murky, and contained floating debris.

Landfill Seep-01-071318-DUP (490-155661-9), Landfill Seep-02-071318 (490-155661-10), Pond-012-071318 (490-155661-12) and Landfill Seep-04-071318 (490-155661-13)

Method(s) PrecSep-21: Radium 226 Prep Batch 160-377701:

Sample aliquot reduced due to matrix interference during the initial preparation of the sample. Crystallized precipitation interferes with chemistry of the method.

Landfill Seep-03-071318 (490-155661-11)

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

Definitions/Glossary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.
G	The Sample MDC is greater than the requested RL.

Glossary

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

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-08-071318

Lab Sample ID: 490-155661-1

Date Collected: 07/13/18 07:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2040		300	20.0	mg/L			07/25/18 21:00	100
Fluoride	0.0915	J	1.00	0.0100	mg/L			07/24/18 16:22	1
Sulfate	1440	B	250	1.50	mg/L			07/25/18 20:45	50

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	1.80		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:24	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00141	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 19:35	1
Arsenic	0.000404	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 19:35	1
Barium	0.0443	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 19:35	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 19:35	1
Boron	0.510	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 19:35	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 19:35	1
Calcium	801		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 19:35	1
Chromium	0.000560	J	0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 19:35	1
Cobalt	0.000691	J	0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 19:35	1
Lead	0.000769	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 19:35	1
Magnesium	291		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 19:35	1
Molybdenum	0.00296	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 19:35	1
Potassium	125		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 19:35	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 19:35	1
Sodium	274		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 19:35	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 19:35	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.16		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.8		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	174		10.0	5.00	mg/L			07/24/18 20:55	1
Total Dissolved Solids	5310		40.0	28.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.332		0.108	0.112	1.00	0.0893	pCi/L	07/19/18 15:20	08/10/18 16:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					07/19/18 15:20	08/10/18 16:41	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-08-071318

Lab Sample ID: 490-155661-1

Date Collected: 07/13/18 07:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.983		0.295	0.309	1.00	0.370	pCi/L	07/19/18 15:49	08/02/18 09:20	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					07/19/18 15:49	08/02/18 09:20	1
Y Carrier	90.5		40 - 110					07/19/18 15:49	08/02/18 09:20	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.31		0.314	0.329	5.00	0.370	pCi/L		08/21/18 03:20	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-12-071318

Lab Sample ID: 490-155661-2

Date Collected: 07/13/18 09:15

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	32.7		3.00	0.200	mg/L			07/24/18 16:37	1
Fluoride	0.0803	J	1.00	0.0100	mg/L			07/24/18 16:37	1
Sulfate	16.1	B	5.00	0.0300	mg/L			07/24/18 16:37	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:29	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000499	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 19:40	1
Arsenic	0.00467	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 19:40	1
Barium	0.0757	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 19:40	1
Beryllium	0.000145	J	0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 19:40	1
Boron	0.0379	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 19:40	1
Cadmium	0.000183	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 19:40	1
Calcium	21.1		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 19:40	1
Chromium	0.00200	J	0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 19:40	1
Cobalt	0.00581		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 19:40	1
Lead	0.00221	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 19:40	1
Magnesium	5.20		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 19:40	1
Molybdenum	0.000948	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 19:40	1
Potassium	2.37		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 19:40	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 19:40	1
Sodium	5.52		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 19:40	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 19:40	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.00		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	38.2		10.0	5.00	mg/L			07/24/18 21:02	1
Total Dissolved Solids	157		10.0	7.00	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.542		0.153	0.161	1.00	0.105	pCi/L	07/19/18 15:20	08/10/18 16:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110					07/19/18 15:20	08/10/18 16:41	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-12-071318

Lab Sample ID: 490-155661-2

Date Collected: 07/13/18 09:15

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.629		0.351	0.356	1.00	0.527	pCi/L	07/19/18 15:49	08/02/18 09:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.9		40 - 110					07/19/18 15:49	08/02/18 09:21	1
Y Carrier	85.6		40 - 110					07/19/18 15:49	08/02/18 09:21	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.17		0.383	0.391	5.00	0.527	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-16-071318

Lab Sample ID: 490-155661-3

Date Collected: 07/13/18 11:00

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23.2		3.00	0.200	mg/L			07/24/18 16:52	1
Fluoride	0.177	J	1.00	0.0100	mg/L			07/24/18 16:52	1
Sulfate	26.5	B	5.00	0.0300	mg/L			07/24/18 16:52	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:35	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000270	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 19:44	1
Arsenic	0.0247		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 19:44	1
Barium	0.190	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 19:44	1
Beryllium	0.000211	J	0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 19:44	1
Boron	0.0321	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 19:44	1
Cadmium	0.000196	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 19:44	1
Calcium	93.8		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 19:44	1
Chromium	0.00383		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 19:44	1
Cobalt	0.00613		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 19:44	1
Lead	0.00521		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 19:44	1
Magnesium	20.3		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 19:44	1
Molybdenum	0.00878	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 19:44	1
Potassium	4.85		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 19:44	1
Selenium	0.000906	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 19:44	1
Sodium	26.7		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 19:44	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 19:44	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.40		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	393		10.0	5.00	mg/L			07/24/18 21:09	1
Total Dissolved Solids	504		20.0	14.0	mg/L			07/18/18 08:50	1

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-14-071318

Lab Sample ID: 490-155661-4

Date Collected: 07/13/18 10:10

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	22.7		3.00	0.200	mg/L			07/24/18 17:07	1
Fluoride	0.144	J	1.00	0.0100	mg/L			07/24/18 17:07	1
Sulfate	159	B	50.0	0.300	mg/L			07/25/18 21:15	10

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0126	J	0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:50	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000312	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 19:49	1
Arsenic	0.0173		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 19:49	1
Barium	0.242		0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 19:49	1
Beryllium	0.000497	J	0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 19:49	1
Boron	0.0694	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 19:49	1
Cadmium	0.000312	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 19:49	1
Calcium	171		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 19:49	1
Chromium	0.00969		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 19:49	1
Cobalt	0.0125		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 19:49	1
Lead	0.0109		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 19:49	1
Magnesium	36.6		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 19:49	1
Molybdenum	0.00550	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 19:49	1
Potassium	4.96		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 19:49	1
Selenium	0.000582	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 19:49	1
Sodium	18.5		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 19:49	1
Thallium	0.000126	J	0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 19:49	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.14		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.8		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	443		10.0	5.00	mg/L			07/24/18 21:17	1
Total Dissolved Solids	790		20.0	14.0	mg/L			07/18/18 08:50	1

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-09-071218

Lab Sample ID: 490-155661-5

Date Collected: 07/12/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	189		30.0	2.00	mg/L			07/25/18 21:59	10
Fluoride	0.239	J F1	1.00	0.0100	mg/L			07/24/18 17:51	1
Sulfate	1310	B	250	1.50	mg/L			07/25/18 22:14	50

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0209	J	0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 17:56	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000200	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:06	1
Arsenic	0.00188	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:06	1
Barium	0.0384	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:06	1
Beryllium	0.00372		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:06	1
Boron	2.19		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:06	1
Cadmium	0.00307		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:06	1
Calcium	460		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:06	1
Chromium	0.00386		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:06	1
Cobalt	0.0447		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:06	1
Lead	0.00507		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:06	1
Magnesium	63.6		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:06	1
Molybdenum	ND		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:06	1
Potassium	9.51		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 20:06	1
Selenium	0.00216	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:06	1
Sodium	42.1		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:06	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:06	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.26		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	ND		10.0	5.00	mg/L			07/24/18 21:21	1
Total Dissolved Solids	2130		20.0	14.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.665		0.213	0.221	1.00	0.167	pCi/L	07/19/18 15:20	08/10/18 16:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.4		40 - 110					07/19/18 15:20	08/10/18 16:40	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-09-071218

Lab Sample ID: 490-155661-5

Date Collected: 07/12/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.810		0.520	0.525	1.00	0.796	pCi/L	07/19/18 15:49	08/02/18 09:22	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	89.4		40 - 110					07/19/18 15:49	08/02/18 09:22	1
Y Carrier	87.1		40 - 110					07/19/18 15:49	08/02/18 09:22	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.48		0.562	0.570	5.00	0.796	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-07-071218

Lab Sample ID: 490-155661-6

Date Collected: 07/12/18 14:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1990		300	20.0	mg/L			07/25/18 22:29	100
Fluoride	0.102	J	1.00	0.0100	mg/L			07/24/18 18:21	1
Sulfate	1480	B	500	3.00	mg/L			07/25/18 22:29	100

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.772		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:01	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:11	1
Arsenic	0.00182	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:11	1
Barium	0.0605	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:11	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:11	1
Boron	1.46		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:11	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:11	1
Calcium	1120		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:11	1
Chromium	0.000340	J	0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:11	1
Cobalt	0.0218		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:11	1
Lead	0.000523	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:11	1
Magnesium	51.8		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:11	1
Molybdenum	0.00219	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:11	1
Potassium	262		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 20:11	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:11	1
Sodium	277		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:11	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:11	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.01		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	87.7		10.0	5.00	mg/L			07/24/18 21:28	1
Total Dissolved Solids	6080		40.0	28.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.566		0.144	0.152	1.00	0.0969	pCi/L	07/19/18 15:20	08/10/18 16:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.4		40 - 110					07/19/18 15:20	08/10/18 16:39	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-07-071218

Lab Sample ID: 490-155661-6

Date Collected: 07/12/18 14:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.831		0.318	0.327	1.00	0.434	pCi/L	07/19/18 15:49	08/02/18 09:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.4		40 - 110					07/19/18 15:49	08/02/18 09:22	1
Y Carrier	87.1		40 - 110					07/19/18 15:49	08/02/18 09:22	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.40		0.349	0.361	5.00	0.434	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-05-071218

Lab Sample ID: 490-155661-7

Date Collected: 07/12/18 14:25

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1670		300	20.0	mg/L			07/25/18 22:44	100
Fluoride	0.0795	J	1.00	0.0100	mg/L			07/24/18 18:36	1
Sulfate	1170	B	500	3.00	mg/L			07/25/18 22:44	100

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.340		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:07	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000366	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:16	1
Arsenic	0.0192		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:16	1
Barium	0.718		0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:16	1
Beryllium	0.000545	J	0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:16	1
Boron	0.853	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:16	1
Cadmium	0.000563	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:16	1
Calcium	916		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:16	1
Chromium	0.0124		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:16	1
Cobalt	0.0327		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:16	1
Lead	0.0104		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:16	1
Magnesium	77.8		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:16	1
Molybdenum	0.00442	J	0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:16	1
Potassium	238		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 20:16	1
Selenium	0.00121	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:16	1
Sodium	285		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:16	1
Thallium	0.000164	J	0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:16	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.95		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	229		10.0	5.00	mg/L			07/24/18 21:41	1
Total Dissolved Solids	5140		40.0	28.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.81		0.503	0.609	1.00	0.187	pCi/L	07/19/18 15:20	08/10/18 16:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.9		40 - 110					07/19/18 15:20	08/10/18 16:40	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-05-071218

Lab Sample ID: 490-155661-7

Date Collected: 07/12/18 14:25

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	3.83	G	0.871	0.940	1.00	1.07	pCi/L	07/19/18 15:49	08/02/18 09:22	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Ba Carrier	82.9		40 - 110					07/19/18 15:49	08/02/18 09:22	1
Y Carrier	83.0		40 - 110					07/19/18 15:49	08/02/18 09:22	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	7.64		1.01	1.12	5.00	1.07	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-01-071318

Lab Sample ID: 490-155661-8

Date Collected: 07/13/18 12:20

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2090		600	40.0	mg/L			07/25/18 23:13	200
Fluoride	1.68		1.00	0.0100	mg/L			07/24/18 18:51	1
Sulfate	1580	B	250	1.50	mg/L			07/25/18 22:58	50

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	3.11		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:12	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00432		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:20	1
Arsenic	0.364		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:20	1
Barium	0.0666	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:20	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:20	1
Boron	1.15		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:20	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:20	1
Calcium	1210		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:20	1
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:20	1
Cobalt	0.0000370	J	0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:20	1
Lead	0.000239	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:20	1
Magnesium	0.290	J	1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:20	1
Molybdenum	0.0925		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:20	1
Potassium	179		10.0	0.596	mg/L		07/18/18 12:44	08/07/18 12:06	10
Selenium	0.00781	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:20	1
Sodium	347		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:20	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:20	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.372		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	9.96		0.100	0.100	SU			07/24/18 17:55	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:55	1
Alkalinity	828		10.0	5.00	mg/L			07/24/18 21:50	1
Total Dissolved Solids	8560		100	70.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.656		0.222	0.229	1.00	0.200	pCi/L	07/19/18 15:20	08/10/18 16:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.6		40 - 110					07/19/18 15:20	08/10/18 16:38	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-01-071318

Lab Sample ID: 490-155661-8

Date Collected: 07/13/18 12:20

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.851	U	0.577	0.582	1.00	0.889	pCi/L	07/19/18 15:49	08/02/18 09:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.6		40 - 110					07/19/18 15:49	08/02/18 09:22	1
Y Carrier	75.9		40 - 110					07/19/18 15:49	08/02/18 09:22	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.51		0.618	0.625	5.00	0.889	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-01-071318-DUP

Lab Sample ID: 490-155661-9

Date Collected: 07/13/18 12:20

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2080		600	40.0	mg/L			07/25/18 23:43	200
Fluoride	1.90		1.00	0.0100	mg/L			07/24/18 19:06	1
Sulfate	1700	B	250	1.50	mg/L			07/25/18 23:28	50

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	3.13		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:18	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00463		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:25	1
Arsenic	0.393		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:25	1
Barium	0.0690	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:25	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:25	1
Boron	1.21		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:25	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:25	1
Calcium	1230		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:25	1
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:25	1
Cobalt	0.0000570	J	0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:25	1
Lead	0.000254	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:25	1
Magnesium	0.335	J	1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:25	1
Molybdenum	0.0981		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:25	1
Potassium	37.3		10.0	0.596	mg/L		07/18/18 12:44	08/07/18 12:09	10
Selenium	0.00913	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:25	1
Sodium	362		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:25	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:25	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.388		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	10.0		0.100	0.100	SU			07/24/18 17:58	1
Temperature	21.9		0.100	0.100	Degrees C			07/24/18 17:58	1
Alkalinity	841		10.0	5.00	mg/L			07/24/18 21:59	1
Total Dissolved Solids	7880		100	70.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.648		0.211	0.218	1.00	0.196	pCi/L	07/20/18 08:40	08/13/18 06:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					07/20/18 08:40	08/13/18 06:34	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-01-071318-DUP

Lab Sample ID: 490-155661-9

Date Collected: 07/13/18 12:20

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0841	U	0.488	0.488	1.00	0.874	pCi/L	07/20/18 09:30	08/02/18 09:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					07/20/18 09:30	08/02/18 09:25	1
Y Carrier	94.6		40 - 110					07/20/18 09:30	08/02/18 09:25	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.564	U	0.532	0.534	5.00	0.874	pCi/L		08/21/18 03:20	1



Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-02-071318

Lab Sample ID: 490-155661-10

Date Collected: 07/13/18 13:10

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1710		150	10.0	mg/L			07/25/18 23:58	50
Fluoride	1.19		1.00	0.0100	mg/L			07/24/18 19:20	1
Sulfate	1500	B	250	1.50	mg/L			07/25/18 23:58	50

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	2.85		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:24	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00218		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:30	1
Arsenic	0.126		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:30	1
Barium	0.0627	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:30	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:30	1
Boron	2.92		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:30	1
Cadmium	0.000464	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:30	1
Calcium	1030		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:30	1
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:30	1
Cobalt	0.000115	J	0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:30	1
Lead	0.000247	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:30	1
Magnesium	0.804	J	1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:30	1
Molybdenum	1.78		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:30	1
Potassium	228		10.0	0.596	mg/L		07/18/18 12:44	08/07/18 12:12	10
Selenium	0.0103		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:30	1
Sodium	315		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:30	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:30	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.167	J	0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	9.02		0.100	0.100	SU			07/24/18 17:58	1
Temperature	21.8		0.100	0.100	Degrees C			07/24/18 17:58	1
Alkalinity	178		10.0	5.00	mg/L			07/24/18 22:08	1
Total Dissolved Solids	7080		100	70.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.658		0.203	0.211	1.00	0.168	pCi/L	07/20/18 08:40	08/13/18 06:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.8		40 - 110					07/20/18 08:40	08/13/18 06:34	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-02-071318

Lab Sample ID: 490-155661-10

Date Collected: 07/13/18 13:10

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.507	U	0.520	0.522	1.00	0.848	pCi/L	07/20/18 09:30	08/02/18 09:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.8		40 - 110					07/20/18 09:30	08/02/18 09:25	1
Y Carrier	85.6		40 - 110					07/20/18 09:30	08/02/18 09:25	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.16		0.558	0.563	5.00	0.848	pCi/L		08/21/18 03:20	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-03-071318

Lab Sample ID: 490-155661-11

Date Collected: 07/13/18 13:30

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4370		1500	100	mg/L			07/26/18 01:56	500
Fluoride	0.269	J	1.00	0.0100	mg/L			07/24/18 19:35	1
Sulfate	2080	B	500	3.00	mg/L			07/26/18 01:41	100

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	7.19		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:29	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0000610	J	0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:34	1
Arsenic	0.00176	J	0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:34	1
Barium	0.140	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:34	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:34	1
Boron	2.49		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:34	1
Cadmium	0.000279	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:34	1
Calcium	2250		10.0	0.412	mg/L		07/18/18 12:44	07/31/18 01:20	10
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:34	1
Cobalt	0.000321	J	0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:34	1
Lead	0.000215	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:34	1
Magnesium	12.6		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:34	1
Molybdenum	0.792		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:34	1
Potassium	1140		10.0	0.596	mg/L		07/18/18 12:44	07/31/18 01:20	10
Selenium	0.00163	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:34	1
Sodium	566		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:34	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:34	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.04		0.100	0.100	SU			07/24/18 17:58	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:58	1
Alkalinity	93.9		10.0	5.00	mg/L			07/24/18 22:15	1
Total Dissolved Solids	12400		100	70.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.41		0.418	0.437	1.00	0.322	pCi/L	07/24/18 13:57	08/16/18 05:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.7		40 - 110					07/24/18 13:57	08/16/18 05:35	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-03-071318

Lab Sample ID: 490-155661-11

Date Collected: 07/13/18 13:30

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.136	U G	0.846	0.846	1.00	1.50	pCi/L	07/24/18 14:24	08/02/18 16:23	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.7		40 - 110					07/24/18 14:24	08/02/18 16:23	1
Y Carrier	92.7		40 - 110					07/24/18 14:24	08/02/18 16:23	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.54		0.944	0.952	5.00	1.50	pCi/L		08/21/18 03:20	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Pond-012-071318

Lab Sample ID: 490-155661-12

Date Collected: 07/13/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1640		300	20.0	mg/L			07/26/18 02:11	100
Fluoride	0.266	J	1.00	0.0100	mg/L			07/24/18 19:50	1
Sulfate	1920	B	500	3.00	mg/L			07/26/18 02:11	100

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	2.52		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:35	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00302		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:39	1
Arsenic	0.278		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:39	1
Barium	0.0854	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:39	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:39	1
Boron	2.12		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:39	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:39	1
Calcium	1050		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 20:39	1
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:39	1
Cobalt	0.000203	J	0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:39	1
Lead	0.000137	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:39	1
Magnesium	11.9		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:39	1
Molybdenum	0.133		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:39	1
Potassium	231		10.0	0.596	mg/L		07/18/18 12:44	08/07/18 12:15	10
Selenium	0.00201	J	0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:39	1
Sodium	316		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:39	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:39	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.0840	J	0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.90		0.100	0.100	SU			07/24/18 17:58	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:58	1
Alkalinity	7.24	J	10.0	5.00	mg/L			07/24/18 22:22	1
Total Dissolved Solids	7180		100	70.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.962		0.258	0.272	1.00	0.223	pCi/L	07/20/18 08:40	08/13/18 06:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110					07/20/18 08:40	08/13/18 06:34	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Pond-012-071318

Lab Sample ID: 490-155661-12

Date Collected: 07/13/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.505	U	0.599	0.600	1.00	0.988	pCi/L	07/20/18 09:30	08/02/18 09:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110					07/20/18 09:30	08/02/18 09:25	1
Y Carrier	77.8		40 - 110					07/20/18 09:30	08/02/18 09:25	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.47		0.652	0.659	5.00	0.988	pCi/L		08/21/18 03:20	1

Client Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-04-071318

Lab Sample ID: 490-155661-13

Date Collected: 07/13/18 14:15

Matrix: Water

Date Received: 07/14/18 10:50

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2710		300	20.0	mg/L			07/26/18 02:26	100
Fluoride	1.53		1.00	0.0100	mg/L			07/24/18 20:05	1
Sulfate	1490	B	500	3.00	mg/L			07/26/18 02:26	100

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	4.07		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 18:41	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00470		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 20:43	1
Arsenic	0.300		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 20:43	1
Barium	0.101	J	0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 20:43	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 20:43	1
Boron	0.799	J	1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 20:43	1
Cadmium	0.000161	J	0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 20:43	1
Calcium	1750		10.0	0.412	mg/L		07/18/18 12:44	07/31/18 01:47	10
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 20:43	1
Cobalt	ND		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 20:43	1
Lead	0.0000730	J	0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 20:43	1
Magnesium	0.347	J	1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 20:43	1
Molybdenum	0.214		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 20:43	1
Potassium	899		10.0	0.596	mg/L		07/18/18 12:44	07/31/18 01:47	10
Selenium	0.0103		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 20:43	1
Sodium	397		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 20:43	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 20:43	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.539		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 11:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	10.1		0.100	0.100	SU			07/24/18 17:58	1
Temperature	21.7		0.100	0.100	Degrees C			07/24/18 17:58	1
Alkalinity	1060		10.0	5.00	mg/L			07/25/18 09:02	1
Total Dissolved Solids	10100		100	70.0	mg/L			07/18/18 08:50	1

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.897		0.234	0.248	1.00	0.171	pCi/L	07/20/18 08:40	08/13/18 06:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.6		40 - 110					07/20/18 08:40	08/13/18 06:35	1

TestAmerica Nashville

Client Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-04-071318

Lab Sample ID: 490-155661-13

Date Collected: 07/13/18 14:15

Matrix: Water

Date Received: 07/14/18 10:50

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.873		0.524	0.530	1.00	0.799	pCi/L	07/20/18 09:30	08/02/18 09:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.6		40 - 110					07/20/18 09:30	08/02/18 09:25	1
Y Carrier	86.4		40 - 110					07/20/18 09:30	08/02/18 09:25	1

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.77		0.574	0.585	5.00	0.799	pCi/L		08/21/18 03:20	1



QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 490-531256/3
Matrix: Water
Analysis Batch: 531256

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	0.200	mg/L			07/24/18 13:54	1
Fluoride	ND		1.00	0.0100	mg/L			07/24/18 13:54	1
Sulfate	0.3643	J	5.00	0.0300	mg/L			07/24/18 13:54	1

Lab Sample ID: LCS 490-531256/4
Matrix: Water
Analysis Batch: 531256

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.350		mg/L		93	80 - 120
Fluoride	1.00	0.9781	J	mg/L		98	80 - 120
Sulfate	10.0	9.696		mg/L		97	80 - 120

Lab Sample ID: LCSD 490-531256/5
Matrix: Water
Analysis Batch: 531256

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.374		mg/L		94	80 - 120	0	20
Fluoride	1.00	0.9558	J	mg/L		95	80 - 120	2	20
Sulfate	10.0	9.589		mg/L		96	80 - 120	1	20

Lab Sample ID: 490-155661-5 MS
Matrix: Water
Analysis Batch: 531256

Client Sample ID: River Seep-09-071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	0.239	J F1	1.00	1.702	F1	mg/L		146	80 - 120

Lab Sample ID: MB 490-531368/3
Matrix: Water
Analysis Batch: 531368

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	0.200	mg/L			07/25/18 18:18	1
Fluoride	ND		1.00	0.0100	mg/L			07/25/18 18:18	1
Sulfate	0.3720	J	5.00	0.0300	mg/L			07/25/18 18:18	1

Lab Sample ID: MB 490-531368/30
Matrix: Water
Analysis Batch: 531368

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	0.200	mg/L			07/26/18 00:57	1
Fluoride	ND		1.00	0.0100	mg/L			07/26/18 00:57	1
Sulfate	0.3740	J	5.00	0.0300	mg/L			07/26/18 00:57	1

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-531368/31
Matrix: Water
Analysis Batch: 531368

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.348		mg/L		93	80 - 120
Fluoride	1.00	0.9475	J	mg/L		95	80 - 120
Sulfate	10.0	9.314		mg/L		93	80 - 120

Lab Sample ID: LCS 490-531368/4
Matrix: Water
Analysis Batch: 531368

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.348		mg/L		93	80 - 120
Fluoride	1.00	0.9854	J	mg/L		98	80 - 120
Sulfate	10.0	9.495		mg/L		95	80 - 120

Lab Sample ID: LCSD 490-531368/32
Matrix: Water
Analysis Batch: 531368

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.368		mg/L		94	80 - 120	0	20
Fluoride	1.00	0.9513	J	mg/L		95	80 - 120	0	20
Sulfate	10.0	9.447		mg/L		94	80 - 120	1	20

Lab Sample ID: LCSD 490-531368/5
Matrix: Water
Analysis Batch: 531368

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.296		mg/L		93	80 - 120	1	20
Fluoride	1.00	0.9931	J	mg/L		99	80 - 120	1	20
Sulfate	10.0	9.710		mg/L		97	80 - 120	2	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 180-250902/1-A
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 250902

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/18/18 12:42	07/24/18 16:47	1

Lab Sample ID: LCS 180-250902/2-A
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250902

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	1.00	1.028		mg/L		103	80 - 120

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 490-155660-A-5-B MS
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 250902

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.0132	J	1.00	1.082		mg/L		107	75 - 125

Lab Sample ID: 490-155660-A-5-C MSD
Matrix: Water
Analysis Batch: 251527

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 250902

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.0132	J	1.00	1.090		mg/L		108	75 - 125	1	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-250903/1-A
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00200	0.0000213	mg/L		07/18/18 12:44	07/28/18 18:53	1
Arsenic	ND		0.00500	0.000118	mg/L		07/18/18 12:44	07/28/18 18:53	1
Barium	ND		0.200	0.000270	mg/L		07/18/18 12:44	07/28/18 18:53	1
Beryllium	ND		0.00200	0.000102	mg/L		07/18/18 12:44	07/28/18 18:53	1
Boron	ND		1.00	0.00339	mg/L		07/18/18 12:44	07/28/18 18:53	1
Cadmium	ND		0.00100	0.000152	mg/L		07/18/18 12:44	07/28/18 18:53	1
Calcium	ND		1.00	0.0412	mg/L		07/18/18 12:44	07/28/18 18:53	1
Chromium	ND		0.00300	0.000339	mg/L		07/18/18 12:44	07/28/18 18:53	1
Cobalt	ND		0.00500	0.0000218	mg/L		07/18/18 12:44	07/28/18 18:53	1
Lead	ND		0.00500	0.0000675	mg/L		07/18/18 12:44	07/28/18 18:53	1
Magnesium	ND		1.00	0.0153	mg/L		07/18/18 12:44	07/28/18 18:53	1
Molybdenum	ND		0.0100	0.000873	mg/L		07/18/18 12:44	07/28/18 18:53	1
Potassium	ND		1.00	0.0596	mg/L		07/18/18 12:44	07/28/18 18:53	1
Selenium	ND		0.0100	0.000348	mg/L		07/18/18 12:44	07/28/18 18:53	1
Sodium	ND		1.00	0.155	mg/L		07/18/18 12:44	07/28/18 18:53	1
Thallium	ND		0.00100	0.0000360	mg/L		07/18/18 12:44	07/28/18 18:53	1

Lab Sample ID: LCS 180-250903/2-A
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.500	0.4729		mg/L		95	80 - 120
Arsenic	0.0400	0.03658		mg/L		91	80 - 120
Barium	2.00	1.840		mg/L		92	80 - 120
Beryllium	0.0500	0.05027		mg/L		101	80 - 120
Boron	1.00	0.8897	J	mg/L		89	80 - 120
Cadmium	0.0500	0.05029		mg/L		101	80 - 120
Calcium	50.0	45.70		mg/L		91	80 - 120
Chromium	0.200	0.1649		mg/L		82	80 - 120
Cobalt	0.500	0.4321		mg/L		86	80 - 120
Lead	0.0200	0.01998		mg/L		100	80 - 120

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

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

Lab Sample ID: LCS 180-250903/2-A
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Magnesium	50.0	45.74		mg/L		91	80 - 120
Molybdenum	1.00	0.9327		mg/L		93	80 - 120
Potassium	50.0	46.09		mg/L		92	80 - 120
Selenium	0.0100	0.009085	J	mg/L		91	80 - 120
Sodium	50.0	44.98		mg/L		90	80 - 120
Thallium	0.0500	0.04846		mg/L		97	80 - 120

Lab Sample ID: 490-155660-A-6-C MS
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		0.500	0.4679		mg/L		94	75 - 125
Arsenic	ND		0.0400	0.03692		mg/L		92	75 - 125
Barium	ND		2.00	1.839		mg/L		92	75 - 125
Beryllium	ND		0.0500	0.04768		mg/L		95	75 - 125
Boron	0.00422	J	1.00	0.8456	J	mg/L		84	75 - 125
Cadmium	ND		0.0500	0.04723		mg/L		94	75 - 125
Calcium	ND		50.0	45.39		mg/L		91	75 - 125
Chromium	ND		0.200	0.1840		mg/L		92	75 - 125
Cobalt	ND		0.500	0.4386		mg/L		88	75 - 125
Lead	0.000399	J	0.0200	0.01986		mg/L		97	75 - 125
Magnesium	0.0156	J	50.0	46.32		mg/L		93	75 - 125
Molybdenum	ND		1.00	0.9262		mg/L		93	75 - 125
Potassium	0.0680	J	50.0	46.15		mg/L		92	75 - 125
Selenium	ND		0.0100	0.01006		mg/L		101	75 - 125
Sodium	ND		50.0	45.34		mg/L		91	75 - 125
Thallium	ND		0.0500	0.04726		mg/L		95	75 - 125

Lab Sample ID: 490-155660-A-6-D MSD
Matrix: Water
Analysis Batch: 252059

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 250903

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		0.500	0.4680		mg/L		94	75 - 125	0	20
Arsenic	ND		0.0400	0.03704		mg/L		93	75 - 125	0	20
Barium	ND		2.00	1.847		mg/L		92	75 - 125	0	20
Beryllium	ND		0.0500	0.04801		mg/L		96	75 - 125	1	20
Boron	0.00422	J	1.00	0.8557	J	mg/L		85	75 - 125	1	20
Cadmium	ND		0.0500	0.04852		mg/L		97	75 - 125	3	20
Calcium	ND		50.0	44.91		mg/L		90	75 - 125	1	20
Chromium	ND		0.200	0.1875		mg/L		94	75 - 125	2	20
Cobalt	ND		0.500	0.4400		mg/L		88	75 - 125	0	20
Lead	0.000399	J	0.0200	0.01961		mg/L		96	75 - 125	1	20
Magnesium	0.0156	J	50.0	45.89		mg/L		92	75 - 125	1	20
Molybdenum	ND		1.00	0.9301		mg/L		93	75 - 125	0	20
Potassium	0.0680	J	50.0	45.93		mg/L		92	75 - 125	0	20
Selenium	ND		0.0100	0.01030		mg/L		103	75 - 125	2	20
Sodium	ND		50.0	45.17		mg/L		90	75 - 125	0	20

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

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

Lab Sample ID: 490-155660-A-6-D MSD
 Matrix: Water
 Analysis Batch: 252059

Client Sample ID: Matrix Spike Duplicate
 Prep Type: Total Recoverable
 Prep Batch: 250903

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Thallium	ND		0.0500	0.04752		mg/L		95	75 - 125	1	20

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-250943/1-A
 Matrix: Water
 Analysis Batch: 251171

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 250943

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.0653	ug/L		07/18/18 15:06	07/20/18 10:52	1

Lab Sample ID: LCS 180-250943/2-A
 Matrix: Water
 Analysis Batch: 251171

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 250943

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	2.50	2.486		ug/L		99	80 - 120

Lab Sample ID: 180-79800-G-1-E MS
 Matrix: Water
 Analysis Batch: 251171

Client Sample ID: Matrix Spike
 Prep Type: Total/NA
 Prep Batch: 250943

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		1.00	0.9270		ug/L		93	75 - 125

Lab Sample ID: 180-79800-G-1-F MSD
 Matrix: Water
 Analysis Batch: 251171

Client Sample ID: Matrix Spike Duplicate
 Prep Type: Total/NA
 Prep Batch: 250943

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		1.00	0.9210		ug/L		92	75 - 125	1	20

Method: 9040C - pH

Lab Sample ID: LCS 490-531203/1
 Matrix: Water
 Analysis Batch: 531203

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.000		SU		100	98 - 103

Lab Sample ID: 490-155660-D-5 DU
 Matrix: Water
 Analysis Batch: 531203

Client Sample ID: Duplicate
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	8.11		8.110		SU		0	20
Temperature	21.7		21.70		Degrees C		0	20

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 9040C - pH (Continued)

Lab Sample ID: LCS 490-531204/1
Matrix: Water
Analysis Batch: 531204

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.000		SU		100	98 - 103

Lab Sample ID: 490-155661-9 DU
Matrix: Water
Analysis Batch: 531204

Client Sample ID: Landfill Seep-01-071318-DUP
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	10.0		10.03		SU		0	20
Temperature	21.9		21.90		Degrees C		0	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-531384/73
Matrix: Water
Analysis Batch: 531384

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		10.0	5.00	mg/L			07/24/18 20:09	1

Lab Sample ID: LCS 490-531384/74
Matrix: Water
Analysis Batch: 531384

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	95.45		mg/L		95	90 - 110

Lab Sample ID: LCSD 490-531384/95
Matrix: Water
Analysis Batch: 531384

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	100	95.67		mg/L		96	90 - 110	0	20

Lab Sample ID: 490-155661-6 DU
Matrix: Water
Analysis Batch: 531384

Client Sample ID: River Seep-07-071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	87.7		88.85		mg/L		1	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 490-529395/1
Matrix: Water
Analysis Batch: 529395

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10.0	7.00	mg/L			07/18/18 08:50	1

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 490-529395/2
Matrix: Water
Analysis Batch: 529395

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	100	103.0		mg/L		103	90 - 110

Lab Sample ID: 490-155661-5 DU
Matrix: Water
Analysis Batch: 529395

Client Sample ID: River Seep-09-071218
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	2130		2194		mg/L		3	20

Lab Sample ID: 490-155661-13 DU
Matrix: Water
Analysis Batch: 529395

Client Sample ID: Landfill Seep-04-071318
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	10100		10080		mg/L		0.1	20

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-376745/23-A
Matrix: Water
Analysis Batch: 381568

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 376745

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.2502		0.100	0.103	1.00	0.106	pCi/L	07/19/18 15:20	08/10/18 16:41	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	97.1		40 - 110		07/19/18 15:20	08/10/18 16:41	1			

Lab Sample ID: LCS 160-376745/1-A
Matrix: Water
Analysis Batch: 381577

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 376745

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	11.66		1.20	1.00	0.0735	pCi/L	103	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	100		40 - 110						

Lab Sample ID: LCSD 160-376745/2-A
Matrix: Water
Analysis Batch: 381577

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 376745

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	10.89		1.13	1.00	0.109	pCi/L	96	68 - 137	0.33	1

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCSD 160-376745/2-A
Matrix: Water
Analysis Batch: 381577

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 376745

	LCSD	LCSD	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	100		40 - 110

Lab Sample ID: MB 160-376796/18-A
Matrix: Water
Analysis Batch: 381804

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 376796

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.2016		0.0795	0.0816	1.00	0.0804	pCi/L	07/20/18 08:40	08/13/18 06:36	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110	07/20/18 08:40	08/13/18 06:36	1

Lab Sample ID: LCS 160-376796/1-A
Matrix: Water
Analysis Batch: 381803

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 376796

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	11.79		1.21	1.00	0.0688	pCi/L	104	68 - 137

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	99.7		40 - 110

Lab Sample ID: 400-156511-B-1-B DU
Matrix: Water
Analysis Batch: 381803

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 376796

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-226	0.266		0.2898		0.103	1.00	0.0896	pCi/L	0.12	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	90.3		40 - 110

Lab Sample ID: MB 160-377701/16-A
Matrix: Water
Analysis Batch: 382769

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 377701

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.2320		0.0970	0.0993	1.00	0.0872	pCi/L	07/24/18 13:57	08/16/18 05:31	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110	07/24/18 13:57	08/16/18 05:31	1

TestAmerica Nashville

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-377701/1-A
Matrix: Water
Analysis Batch: 382767

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 377701

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	15.1	13.45		1.40	1.00	0.0919	pCi/L	89	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	94.1		40 - 110						

Lab Sample ID: 600-169468-C-1-A DU
Matrix: Water
Analysis Batch: 382767

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 377701

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-226	0.394		0.3673		0.110	1.00	0.0820	pCi/L	0.12	1
Carrier	DU %Yield	DU Qualifier	Limits							
Ba Carrier	94.4		40 - 110							

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-376750/23-A
Matrix: Water
Analysis Batch: 379784

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 376750

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.1002	U	0.206	0.206	1.00	0.387	pCi/L	07/19/18 15:49	08/02/18 09:22	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared		Analyzed		Dil Fac	
Ba Carrier	97.1		40 - 110		07/19/18 15:49		08/02/18 09:22		1	
Y Carrier	85.6		40 - 110		07/19/18 15:49		08/02/18 09:22		1	

Lab Sample ID: LCS 160-376750/1-A
Matrix: Water
Analysis Batch: 379945

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 376750

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	11.2	11.05		1.23	1.00	0.352	pCi/L	99	56 - 140
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	100		40 - 110						
Y Carrier	86.4		40 - 110						

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCSD 160-376750/2-A
Matrix: Water
Analysis Batch: 379945

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 376750

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	11.2	11.70		1.29	1.00	0.336	pCi/L	105	56 - 140	0.26	1
Carrier	%Yield	LCSD Qualifier	Limits								
Ba Carrier	100		40 - 110								
Y Carrier	87.5		40 - 110								

Lab Sample ID: MB 160-376805/18-A
Matrix: Water
Analysis Batch: 379949

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 376805

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4979		0.255	0.259	1.00	0.379	pCi/L	07/20/18 09:30	08/02/18 09:27	1
Carrier	%Yield	MB Qualifier	Limits							
Ba Carrier	102		40 - 110							
Y Carrier	91.6		40 - 110							
								Prepared	Analyzed	Dil Fac
								07/20/18 09:30	08/02/18 09:27	1
								07/20/18 09:30	08/02/18 09:27	1

Lab Sample ID: LCS 160-376805/1-A
Matrix: Water
Analysis Batch: 379784

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 376805

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228	11.2	11.33		1.25	1.00	0.352	pCi/L	102	56 - 140		
Carrier	%Yield	LCS Qualifier	Limits								
Ba Carrier	99.7		40 - 110								
Y Carrier	91.2		40 - 110								

Lab Sample ID: 400-156511-B-1-D DU
Matrix: Water
Analysis Batch: 379784

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 376805

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Radium-228	0.131	U	0.2403	U	0.319	1.00	0.528	pCi/L	0.20	1
Carrier	%Yield	DU Qualifier	Limits							
Ba Carrier	90.3		40 - 110							
Y Carrier	84.5		40 - 110							

QC Sample Results

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: MB 160-377705/16-A
Matrix: Water
Analysis Batch: 380015

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 377705

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.3838	U	0.431	0.433	1.00	0.707	pCi/L	07/24/18 14:24	08/02/18 20:52	1
Carrier	MB MB		Limits		Prepared	Analyzed	Dil Fac			
	%Yield	Qualifier								
Ba Carrier	94.7		40 - 110		07/24/18 14:24	08/02/18 20:52	1			
Y Carrier	90.1		40 - 110		07/24/18 14:24	08/02/18 20:52	1			

Lab Sample ID: LCS 160-377705/1-A
Matrix: Water
Analysis Batch: 380015

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 377705

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-228	14.9	14.45		1.62	1.00	0.461	pCi/L	97	56 - 140
Carrier	LCS LCS		Limits		Prepared	Analyzed	Dil Fac		
	%Yield	Qualifier							
Ba Carrier	94.1		40 - 110						
Y Carrier	88.6		40 - 110						

Lab Sample ID: 600-169468-C-1-B DU
Matrix: Water
Analysis Batch: 380015

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 377705

Analyte	Sample Sample		DU	DU	Total	RL	MDC	Unit	RER	RER	RER
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					Limit	
Radium-228	0.0185	U	0.1918	U	0.201	1.00	0.325	pCi/L	0.43	1	
Carrier	DU DU		Limits		Prepared	Analyzed	Dil Fac				
	%Yield	Qualifier									
Ba Carrier	94.4		40 - 110								
Y Carrier	90.8		40 - 110								

QC Association Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

HPLC/IC

Analysis Batch: 531256

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	9056A	
490-155661-2	River Seep-12-071318	Total/NA	Water	9056A	
490-155661-3	River Seep-16-071318	Total/NA	Water	9056A	
490-155661-4	River Seep-14-071318	Total/NA	Water	9056A	
490-155661-5	River Seep-09-071218	Total/NA	Water	9056A	
490-155661-6	River Seep-07-071218	Total/NA	Water	9056A	
490-155661-7	River Seep-05-071218	Total/NA	Water	9056A	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	9056A	
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	9056A	
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	9056A	
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	9056A	
490-155661-12	Pond-012-071318	Total/NA	Water	9056A	
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	9056A	
MB 490-531256/3	Method Blank	Total/NA	Water	9056A	
LCS 490-531256/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 490-531256/5	Lab Control Sample Dup	Total/NA	Water	9056A	
490-155661-5 MS	River Seep-09-071218	Total/NA	Water	9056A	

Analysis Batch: 531368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	9056A	
490-155661-1	River Seep-08-071318	Total/NA	Water	9056A	
490-155661-4	River Seep-14-071318	Total/NA	Water	9056A	
490-155661-5	River Seep-09-071218	Total/NA	Water	9056A	
490-155661-5	River Seep-09-071218	Total/NA	Water	9056A	
490-155661-6	River Seep-07-071218	Total/NA	Water	9056A	
490-155661-7	River Seep-05-071218	Total/NA	Water	9056A	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	9056A	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	9056A	
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	9056A	
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	9056A	
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	9056A	
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	9056A	
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	9056A	
490-155661-12	Pond-012-071318	Total/NA	Water	9056A	
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	9056A	
MB 490-531368/3	Method Blank	Total/NA	Water	9056A	
MB 490-531368/30	Method Blank	Total/NA	Water	9056A	
LCS 490-531368/31	Lab Control Sample	Total/NA	Water	9056A	
LCS 490-531368/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 490-531368/32	Lab Control Sample Dup	Total/NA	Water	9056A	
LCSD 490-531368/5	Lab Control Sample Dup	Total/NA	Water	9056A	

Metals

Prep Batch: 250902

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total Recoverable	Water	3005A	
490-155661-2	River Seep-12-071318	Total Recoverable	Water	3005A	
490-155661-3	River Seep-16-071318	Total Recoverable	Water	3005A	

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Metals (Continued)

Prep Batch: 250902 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-4	River Seep-14-071318	Total Recoverable	Water	3005A	
490-155661-5	River Seep-09-071218	Total Recoverable	Water	3005A	
490-155661-6	River Seep-07-071218	Total Recoverable	Water	3005A	
490-155661-7	River Seep-05-071218	Total Recoverable	Water	3005A	
490-155661-8	Landfill Seep-01-071318	Total Recoverable	Water	3005A	
490-155661-9	Landfill Seep-01-071318-DUP	Total Recoverable	Water	3005A	
490-155661-10	Landfill Seep-02-071318	Total Recoverable	Water	3005A	
490-155661-11	Landfill Seep-03-071318	Total Recoverable	Water	3005A	
490-155661-12	Pond-012-071318	Total Recoverable	Water	3005A	
490-155661-13	Landfill Seep-04-071318	Total Recoverable	Water	3005A	
MB 180-250902/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-250902/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
490-155660-A-5-B MS	Matrix Spike	Total Recoverable	Water	3005A	
490-155660-A-5-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Prep Batch: 250903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total Recoverable	Water	3005A	
490-155661-2	River Seep-12-071318	Total Recoverable	Water	3005A	
490-155661-3	River Seep-16-071318	Total Recoverable	Water	3005A	
490-155661-4	River Seep-14-071318	Total Recoverable	Water	3005A	
490-155661-5	River Seep-09-071218	Total Recoverable	Water	3005A	
490-155661-6	River Seep-07-071218	Total Recoverable	Water	3005A	
490-155661-7	River Seep-05-071218	Total Recoverable	Water	3005A	
490-155661-8	Landfill Seep-01-071318	Total Recoverable	Water	3005A	
490-155661-9	Landfill Seep-01-071318-DUP	Total Recoverable	Water	3005A	
490-155661-10	Landfill Seep-02-071318	Total Recoverable	Water	3005A	
490-155661-11	Landfill Seep-03-071318	Total Recoverable	Water	3005A	
490-155661-12	Pond-012-071318	Total Recoverable	Water	3005A	
490-155661-13	Landfill Seep-04-071318	Total Recoverable	Water	3005A	
MB 180-250903/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-250903/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
490-155660-A-6-C MS	Matrix Spike	Total Recoverable	Water	3005A	
490-155660-A-6-D MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Prep Batch: 250943

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	7470A	
490-155661-2	River Seep-12-071318	Total/NA	Water	7470A	
490-155661-3	River Seep-16-071318	Total/NA	Water	7470A	
490-155661-4	River Seep-14-071318	Total/NA	Water	7470A	
490-155661-5	River Seep-09-071218	Total/NA	Water	7470A	
490-155661-6	River Seep-07-071218	Total/NA	Water	7470A	
490-155661-7	River Seep-05-071218	Total/NA	Water	7470A	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	7470A	
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	7470A	
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	7470A	
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	7470A	
490-155661-12	Pond-012-071318	Total/NA	Water	7470A	
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	7470A	
MB 180-250943/1-A	Method Blank	Total/NA	Water	7470A	

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Metals (Continued)

Prep Batch: 250943 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-250943/2-A	Lab Control Sample	Total/NA	Water	7470A	
180-79800-G-1-E MS	Matrix Spike	Total/NA	Water	7470A	
180-79800-G-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	

Analysis Batch: 251171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	EPA 7470A	250943
490-155661-2	River Seep-12-071318	Total/NA	Water	EPA 7470A	250943
490-155661-3	River Seep-16-071318	Total/NA	Water	EPA 7470A	250943
490-155661-4	River Seep-14-071318	Total/NA	Water	EPA 7470A	250943
490-155661-5	River Seep-09-071218	Total/NA	Water	EPA 7470A	250943
490-155661-6	River Seep-07-071218	Total/NA	Water	EPA 7470A	250943
490-155661-7	River Seep-05-071218	Total/NA	Water	EPA 7470A	250943
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	EPA 7470A	250943
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	EPA 7470A	250943
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	EPA 7470A	250943
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	EPA 7470A	250943
490-155661-12	Pond-012-071318	Total/NA	Water	EPA 7470A	250943
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	EPA 7470A	250943
MB 180-250943/1-A	Method Blank	Total/NA	Water	EPA 7470A	250943
LCS 180-250943/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	250943
180-79800-G-1-E MS	Matrix Spike	Total/NA	Water	EPA 7470A	250943
180-79800-G-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 7470A	250943

Analysis Batch: 251527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total Recoverable	Water	6010C	250902
490-155661-2	River Seep-12-071318	Total Recoverable	Water	6010C	250902
490-155661-3	River Seep-16-071318	Total Recoverable	Water	6010C	250902
490-155661-4	River Seep-14-071318	Total Recoverable	Water	6010C	250902
490-155661-5	River Seep-09-071218	Total Recoverable	Water	6010C	250902
490-155661-6	River Seep-07-071218	Total Recoverable	Water	6010C	250902
490-155661-7	River Seep-05-071218	Total Recoverable	Water	6010C	250902
490-155661-8	Landfill Seep-01-071318	Total Recoverable	Water	6010C	250902
490-155661-9	Landfill Seep-01-071318-DUP	Total Recoverable	Water	6010C	250902
490-155661-10	Landfill Seep-02-071318	Total Recoverable	Water	6010C	250902
490-155661-11	Landfill Seep-03-071318	Total Recoverable	Water	6010C	250902
490-155661-12	Pond-012-071318	Total Recoverable	Water	6010C	250902
490-155661-13	Landfill Seep-04-071318	Total Recoverable	Water	6010C	250902
MB 180-250902/1-A	Method Blank	Total Recoverable	Water	6010C	250902
LCS 180-250902/2-A	Lab Control Sample	Total Recoverable	Water	6010C	250902
490-155660-A-5-B MS	Matrix Spike	Total Recoverable	Water	6010C	250902
490-155660-A-5-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	6010C	250902

Analysis Batch: 252059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total Recoverable	Water	6020A	250903
490-155661-2	River Seep-12-071318	Total Recoverable	Water	6020A	250903
490-155661-3	River Seep-16-071318	Total Recoverable	Water	6020A	250903
490-155661-4	River Seep-14-071318	Total Recoverable	Water	6020A	250903
490-155661-5	River Seep-09-071218	Total Recoverable	Water	6020A	250903

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Metals (Continued)

Analysis Batch: 252059 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-6	River Seep-07-071218	Total Recoverable	Water	6020A	250903
490-155661-7	River Seep-05-071218	Total Recoverable	Water	6020A	250903
490-155661-8	Landfill Seep-01-071318	Total Recoverable	Water	6020A	250903
490-155661-9	Landfill Seep-01-071318-DUP	Total Recoverable	Water	6020A	250903
490-155661-10	Landfill Seep-02-071318	Total Recoverable	Water	6020A	250903
490-155661-11	Landfill Seep-03-071318	Total Recoverable	Water	6020A	250903
490-155661-12	Pond-012-071318	Total Recoverable	Water	6020A	250903
490-155661-13	Landfill Seep-04-071318	Total Recoverable	Water	6020A	250903
MB 180-250903/1-A	Method Blank	Total Recoverable	Water	6020A	250903
LCS 180-250903/2-A	Lab Control Sample	Total Recoverable	Water	6020A	250903
490-155660-A-6-C MS	Matrix Spike	Total Recoverable	Water	6020A	250903
490-155660-A-6-D MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020A	250903

Analysis Batch: 252316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-11	Landfill Seep-03-071318	Total Recoverable	Water	6020A	250903
490-155661-13	Landfill Seep-04-071318	Total Recoverable	Water	6020A	250903

Analysis Batch: 253104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-8	Landfill Seep-01-071318	Total Recoverable	Water	6020A	250903
490-155661-9	Landfill Seep-01-071318-DUP	Total Recoverable	Water	6020A	250903
490-155661-10	Landfill Seep-02-071318	Total Recoverable	Water	6020A	250903
490-155661-12	Pond-012-071318	Total Recoverable	Water	6020A	250903

General Chemistry

Analysis Batch: 529395

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	SM 2540C	
490-155661-2	River Seep-12-071318	Total/NA	Water	SM 2540C	
490-155661-3	River Seep-16-071318	Total/NA	Water	SM 2540C	
490-155661-4	River Seep-14-071318	Total/NA	Water	SM 2540C	
490-155661-5	River Seep-09-071218	Total/NA	Water	SM 2540C	
490-155661-6	River Seep-07-071218	Total/NA	Water	SM 2540C	
490-155661-7	River Seep-05-071218	Total/NA	Water	SM 2540C	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	SM 2540C	
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	SM 2540C	
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	SM 2540C	
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	SM 2540C	
490-155661-12	Pond-012-071318	Total/NA	Water	SM 2540C	
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	SM 2540C	
MB 490-529395/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 490-529395/2	Lab Control Sample	Total/NA	Water	SM 2540C	
490-155661-5 DU	River Seep-09-071218	Total/NA	Water	SM 2540C	
490-155661-13 DU	Landfill Seep-04-071318	Total/NA	Water	SM 2540C	

Analysis Batch: 531203

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	9040C	

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

General Chemistry (Continued)

Analysis Batch: 531203 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-2	River Seep-12-071318	Total/NA	Water	9040C	
490-155661-3	River Seep-16-071318	Total/NA	Water	9040C	
490-155661-4	River Seep-14-071318	Total/NA	Water	9040C	
490-155661-5	River Seep-09-071218	Total/NA	Water	9040C	
490-155661-6	River Seep-07-071218	Total/NA	Water	9040C	
490-155661-7	River Seep-05-071218	Total/NA	Water	9040C	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	9040C	
LCS 490-531203/1	Lab Control Sample	Total/NA	Water	9040C	
490-155660-D-5 DU	Duplicate	Total/NA	Water	9040C	

Analysis Batch: 531204

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	9040C	
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	9040C	
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	9040C	
490-155661-12	Pond-012-071318	Total/NA	Water	9040C	
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	9040C	
LCS 490-531204/1	Lab Control Sample	Total/NA	Water	9040C	
490-155661-9 DU	Landfill Seep-01-071318-DUP	Total/NA	Water	9040C	

Analysis Batch: 531384

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	SM 2320B	
490-155661-2	River Seep-12-071318	Total/NA	Water	SM 2320B	
490-155661-3	River Seep-16-071318	Total/NA	Water	SM 2320B	
490-155661-4	River Seep-14-071318	Total/NA	Water	SM 2320B	
490-155661-5	River Seep-09-071218	Total/NA	Water	SM 2320B	
490-155661-6	River Seep-07-071218	Total/NA	Water	SM 2320B	
490-155661-7	River Seep-05-071218	Total/NA	Water	SM 2320B	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	SM 2320B	
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	SM 2320B	
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	SM 2320B	
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	SM 2320B	
490-155661-12	Pond-012-071318	Total/NA	Water	SM 2320B	
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	SM 2320B	
MB 490-531384/73	Method Blank	Total/NA	Water	SM 2320B	
LCS 490-531384/74	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-531384/95	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
490-155661-6 DU	River Seep-07-071218	Total/NA	Water	SM 2320B	

Rad

Prep Batch: 376745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	PrecSep-21	
490-155661-2	River Seep-12-071318	Total/NA	Water	PrecSep-21	
490-155661-5	River Seep-09-071218	Total/NA	Water	PrecSep-21	
490-155661-6	River Seep-07-071218	Total/NA	Water	PrecSep-21	
490-155661-7	River Seep-05-071218	Total/NA	Water	PrecSep-21	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	PrecSep-21	

TestAmerica Nashville

QC Association Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Rad (Continued)

Prep Batch: 376745 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 160-376745/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-376745/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-376745/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 376750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-1	River Seep-08-071318	Total/NA	Water	PrecSep_0	
490-155661-2	River Seep-12-071318	Total/NA	Water	PrecSep_0	
490-155661-5	River Seep-09-071218	Total/NA	Water	PrecSep_0	
490-155661-6	River Seep-07-071218	Total/NA	Water	PrecSep_0	
490-155661-7	River Seep-05-071218	Total/NA	Water	PrecSep_0	
490-155661-8	Landfill Seep-01-071318	Total/NA	Water	PrecSep_0	
MB 160-376750/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-376750/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-376750/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 376796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	PrecSep-21	
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	PrecSep-21	
490-155661-12	Pond-012-071318	Total/NA	Water	PrecSep-21	
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	PrecSep-21	
MB 160-376796/18-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-376796/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
400-156511-B-1-B DU	Duplicate	Total/NA	Water	PrecSep-21	

Prep Batch: 376805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-9	Landfill Seep-01-071318-DUP	Total/NA	Water	PrecSep_0	
490-155661-10	Landfill Seep-02-071318	Total/NA	Water	PrecSep_0	
490-155661-12	Pond-012-071318	Total/NA	Water	PrecSep_0	
490-155661-13	Landfill Seep-04-071318	Total/NA	Water	PrecSep_0	
MB 160-376805/18-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-376805/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
400-156511-B-1-D DU	Duplicate	Total/NA	Water	PrecSep_0	

Prep Batch: 377701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	PrecSep-21	
MB 160-377701/16-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-377701/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
600-169468-C-1-A DU	Duplicate	Total/NA	Water	PrecSep-21	

Prep Batch: 377705

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-155661-11	Landfill Seep-03-071318	Total/NA	Water	PrecSep_0	
MB 160-377705/16-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-377705/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
600-169468-C-1-B DU	Duplicate	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-08-071318

Lab Sample ID: 490-155661-1

Date Collected: 07/13/18 07:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 16:22	SW1	TAL NSH
Total/NA	Analysis	9056A		50			531368	07/25/18 20:45	JHS	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/25/18 21:00	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:24	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 19:35	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:04	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 20:55	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			999.94 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381568	08/10/18 16:41	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.94 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379945	08/02/18 09:20	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: River Seep-12-071318

Lab Sample ID: 490-155661-2

Date Collected: 07/13/18 09:15

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 16:37	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:29	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 19:40	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:05	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:02	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			750.37 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381568	08/10/18 16:41	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.37 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:21	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-16-071318

Lab Sample ID: 490-155661-3

Date Collected: 07/13/18 11:00

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 16:52	SW1	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:35	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 19:44	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:06	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:09	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH

Client Sample ID: River Seep-14-071318

Lab Sample ID: 490-155661-4

Date Collected: 07/13/18 10:10

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 17:07	SW1	TAL NSH
Total/NA	Analysis	9056A		10			531368	07/25/18 21:15	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:50	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 19:49	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:07	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:17	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH

Client Sample ID: River Seep-09-071218

Lab Sample ID: 490-155661-5

Date Collected: 07/12/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 17:51	SW1	TAL NSH
Total/NA	Analysis	9056A		10			531368	07/25/18 21:59	JHS	TAL NSH
Total/NA	Analysis	9056A		50			531368	07/25/18 22:14	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 17:56	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:06	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:08	RJR	TAL PIT

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-09-071218

Lab Sample ID: 490-155661-5

Date Collected: 07/12/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:21	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			500.17 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381569	08/10/18 16:40	RTM	TAL SL
Total/NA	Prep	PrecSep_0			500.17 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:22	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: River Seep-07-071218

Lab Sample ID: 490-155661-6

Date Collected: 07/12/18 14:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 18:21	SW1	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/25/18 22:29	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:01	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:11	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:09	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:28	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			999.84 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381569	08/10/18 16:39	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.84 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:22	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: River Seep-05-071218

Lab Sample ID: 490-155661-7

Date Collected: 07/12/18 14:25

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 18:36	SW1	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/25/18 22:44	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:07	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:16	WTR	TAL PIT

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: River Seep-05-071218

Lab Sample ID: 490-155661-7

Date Collected: 07/12/18 14:25

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:12	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:41	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			499.95 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381569	08/10/18 16:40	RTM	TAL SL
Total/NA	Prep	PrecSep_0			499.95 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:22	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: Landfill Seep-01-071318

Lab Sample ID: 490-155661-8

Date Collected: 07/13/18 12:20

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 18:51	SW1	TAL NSH
Total/NA	Analysis	9056A		50			531368	07/25/18 22:58	JHS	TAL NSH
Total/NA	Analysis	9056A		200			531368	07/25/18 23:13	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:12	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		10			253104	08/07/18 12:06	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:20	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:13	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531203	07/24/18 17:55	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:50	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			500.48 mL	1.0 g	376745	07/19/18 15:20	JLC	TAL SL
Total/NA	Analysis	903.0		1			381577	08/10/18 16:38	RTM	TAL SL
Total/NA	Prep	PrecSep_0			500.48 mL	1.0 g	376750	07/19/18 15:49	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:22	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: Landfill Seep-01-071318-DUP

Lab Sample ID: 490-155661-9

Date Collected: 07/13/18 12:20

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 19:06	SW1	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-01-071318-DUP

Lab Sample ID: 490-155661-9

Date Collected: 07/13/18 12:20

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		50			531368	07/25/18 23:28	JHS	TAL NSH
Total/NA	Analysis	9056A		200			531368	07/25/18 23:43	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:18	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		10			253104	08/07/18 12:09	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:25	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:14	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531204	07/24/18 17:58	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 21:59	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			500.28 mL	1.0 g	376796	07/20/18 08:40	JLC	TAL SL
Total/NA	Analysis	903.0		1			381803	08/13/18 06:34	CDR	TAL SL
Total/NA	Prep	PrecSep_0			500.28 mL	1.0 g	376805	07/20/18 09:30	JLC	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	379784	08/02/18 09:25	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: Landfill Seep-02-071318

Lab Sample ID: 490-155661-10

Date Collected: 07/13/18 13:10

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 19:20	SW1	TAL NSH
Total/NA	Analysis	9056A		50			531368	07/25/18 23:58	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:24	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		10			253104	08/07/18 12:12	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:30	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:15	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531204	07/24/18 17:58	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 22:08	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			500.14 mL	1.0 g	376796	07/20/18 08:40	JLC	TAL SL
Total/NA	Analysis	903.0		1			381803	08/13/18 06:34	CDR	TAL SL
Total/NA	Prep	PrecSep_0			500.14 mL	1.0 g	376805	07/20/18 09:30	JLC	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	379784	08/02/18 09:25	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Landfill Seep-03-071318

Lab Sample ID: 490-155661-11

Date Collected: 07/13/18 13:30

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 19:35	SW1	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/26/18 01:41	JHS	TAL NSH
Total/NA	Analysis	9056A		500			531368	07/26/18 01:56	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:29	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:34	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		10	1.0 mL	1.0 mL	252316	07/31/18 01:20	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:16	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531204	07/24/18 17:58	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 22:15	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			250.40 mL	1.0 g	377701	07/24/18 13:57	JLC	TAL SL
Total/NA	Analysis	903.0		1			382767	08/16/18 05:35	ALS	TAL SL
Total/NA	Prep	PrecSep_0			250.40 mL	1.0 g	377705	07/24/18 14:24	JLC	TAL SL
Total/NA	Analysis	904.0		1			380015	08/02/18 16:23	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: Pond-012-071318

Lab Sample ID: 490-155661-12

Date Collected: 07/13/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 19:50	SW1	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/26/18 02:11	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:35	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		10			253104	08/07/18 12:15	RSK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:39	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:17	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531204	07/24/18 17:58	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/24/18 22:22	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			500.18 mL	1.0 g	376796	07/20/18 08:40	JLC	TAL SL
Total/NA	Analysis	903.0		1			381803	08/13/18 06:34	CDR	TAL SL
Total/NA	Prep	PrecSep_0			500.18 mL	1.0 g	376805	07/20/18 09:30	JLC	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	379784	08/02/18 09:25	CDR	TAL SL

TestAmerica Nashville

Lab Chronicle

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Client Sample ID: Pond-012-071318

Lab Sample ID: 490-155661-12

Date Collected: 07/13/18 13:50

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Client Sample ID: Landfill Seep-04-071318

Lab Sample ID: 490-155661-13

Date Collected: 07/13/18 14:15

Matrix: Water

Date Received: 07/14/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1			531256	07/24/18 20:05	SW1	TAL NSH
Total/NA	Analysis	9056A		100			531368	07/26/18 02:26	JHS	TAL NSH
Total Recoverable	Prep	3005A			50 mL	50 mL	250902	07/18/18 12:42	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			251527	07/24/18 18:41	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1	1.0 mL	1.0 mL	252059	07/28/18 20:43	WTR	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	250903	07/18/18 12:44	NAM	TAL PIT
Total Recoverable	Analysis	6020A		10	1.0 mL	1.0 mL	252316	07/31/18 01:47	WTR	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	250943	07/18/18 15:06	RJR	TAL PIT
Total/NA	Analysis	EPA 7470A		1			251171	07/20/18 11:18	RJR	TAL PIT
Total/NA	Analysis	9040C		1			531204	07/24/18 17:58	JDG	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	531384	07/25/18 09:02	BMC	TAL NSH
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	529395	07/18/18 08:50	BMC	TAL NSH
Total/NA	Prep	PrecSep-21			500.06 mL	1.0 g	376796	07/20/18 08:40	JLC	TAL SL
Total/NA	Analysis	903.0		1			381803	08/13/18 06:35	CDR	TAL SL
Total/NA	Prep	PrecSep_0			500.06 mL	1.0 g	376805	07/20/18 09:30	JLC	TAL SL
Total/NA	Analysis	904.0		1			379784	08/02/18 09:25	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			384175	08/21/18 03:20	RTM	TAL SL

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Method Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL NSH
6010C	Metals (ICP)	SW846	TAL PIT
6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
9040C	pH	SW846	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL NSH
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT

Protocol References:

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

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

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Accreditation/Certification Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Laboratory: TestAmerica Nashville

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kentucky (UST)	State Program	4	19	06-30-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9040C		Water	pH
9040C		Water	Temperature
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate
SM 2320B		Water	Alkalinity
SM 2540C		Water	Total Dissolved Solids

Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-19
California	State Program	9	2891	04-30-19
Connecticut	State Program	1	PH-0688	09-30-18
Florida	NELAP	4	E871008	06-30-19
Illinois	NELAP	5	200005	06-30-19
Kansas	NELAP	7	E-10350	01-31-19
Louisiana	NELAP	6	04041	06-30-19
Nevada	State Program	9	PA00164	07-31-19
New Hampshire	NELAP	1	2030	04-04-19
New Jersey	NELAP	2	PA005	06-30-19
New York	NELAP	2	11182	03-31-19
North Carolina (WW/SW)	State Program	4	434	12-31-18
Oregon	NELAP	10	PA-2151	01-28-19
Pennsylvania	NELAP	3	02-00416	04-30-19
South Carolina	State Program	4	89014	04-30-19
Texas	NELAP	6	T104704528-15-2	03-31-19
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-19
Virginia	NELAP	3	460189	09-14-18 *
West Virginia DEP	State Program	3	142	01-31-19
Wisconsin	State Program	5	998027800	08-31-18

Laboratory: TestAmerica St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

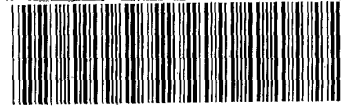
TestAmerica Job ID: 490-155661-1

Laboratory: TestAmerica St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18 *
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18 *
West Virginia DEP	State Program	3	381	08-31-18 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.



COOLER RECEIPT FORM

490-155661 Chain of Custody

Cooler Received/Opened On 7/14/2018 @ 1050

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 2692 (last 4 digits, FedEx) Courier: FedEx
IR Gun ID 17960357 pH Strip Lot NA Chlorine Strip Lot NA
2. Temperature of rep. sample or temp blank when opened: 5.9 Degrees Celsius
3. If item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA
4. Were custody seals on outside of cooler? YES NO...NA
If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA
6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) GH

7. Were custody seals on containers: YES NO and intact YES...NO NA
Were these signed and dated correctly? YES...NO...NA
8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None
9. Cooling process: ICE Ice-pack Ice (direct contact) Dry ice Other None
10. Did all containers arrive in good condition (unbroken)? YES...NO...NA
11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA
12. Did all container labels and tags agree with custody papers? YES...NO...NA
- 13a. Were VOA vials received? YES NO...NA
- b. Was there any observable headspace present in any VOA vial? YES...NO...NA



Larger than this.

14. Was there a Trip Blank in this cooler? YES NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) ADH

- 15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO NA
- b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA
16. Was residual chlorine present? YES...NO NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) ADH

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA
18. Did you sign the custody papers in the appropriate place? YES...NO...NA
19. Were correct containers used for the analysis requested? YES...NO...NA
20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) ADH

I certify that I attached a label with the unique LIMS number to each container (initial) ADH

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO...# _____

COOLER RECEIPT FORM

Cooler Received/Opened On 7/14/2018 @ 10:50

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 2681 (last 4 digits, FedEx) Courier: FedEx
 IR Gun ID 17960353 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 1.0 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES NO NA

I certify that I opened the cooler and answered questions 1-6 (initial) KOF

7. Were custody seals on containers: YES NO and Intact YES...NO NA

Were these signed and dated correctly? YES...NO NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES NO NA

b. Was there any observable headspace present in any VOA vial? YES...NO NA



14. Was there a Trip Blank in this cooler? YES NO NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) KOF

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) KOF

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) KOF

I certify that I attached a label with the unique LIMS number to each container (initial) KOF

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO # _____

COOLER RECEIPT FORM

Cooler Received/Opened On 7/14/2018 @1050

Time Samples Removed From Cooler _____ Time Samples Placed In Storage _____ (2 Hour Window)

1. Tracking # 2670 (last 4 digits, FedEx) Courier: FedEx
 IR Gun ID 14740456 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 3.1 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA
 If yes, how many and where: 1 From

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) AS

7. Were custody seals on containers: YES NO and Intact YES...NO...NA
 Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA



14. Was there a Trip Blank in this cooler? YES NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) AS

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) AS

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) AS

I certify that I attached a label with the unique LIMS number to each container (initial) AS

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES NO..# _____

TestAmerica Nashville
 2960 Foster Creighton Drive
 Nashville, TN 37204
 Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information
 Client Contact: **Chris Davis**
 Phone: **513-237-1854**
 Company: **Big Rivers Electric Corporation**
 Address: **PO BOX 24**
 City: **Henderson**
 State, Zip: **KY, 42419**
 Phone: **270-844-6010(Tel)**
 Email: **Gregory.Dick@bigrivers.com**
 Project Name: **Big Rivers Electric Corp - Henderson KY**
 Site: **Setree Green Landfill**

Lab Fill: **Cisneros, Roxanne**
 E-Mail: **roxanne.cisneros@testamericainc.com**
 Carrier Tracking No(s): **Flex 32605**
 COC No: **490-86693-25173.1**
 Page: **Page 1 of 2**
 Job #:

Due Date Requested: **Standard**
 TAT Requested (days): **Standard**
 PO #: **270-844-6010(Tel)**
 Purchase Order - see DOCS
 WO #:
 Matrix: **Water**
 Sample Type (C=Comp, G=grab): **G**
 Sample Time: **0750**
 Sample Date: **7/13/18**
 Preservation Code:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Soil, On-waste, etc.)	Field Filtered Sample (Yes or No)	Form MS/MSD (Yes or No)	2320B, 8040C, 9056, ORGFM, 28D	6010A, 6020A	2640C, Calcd - TDS	Redun 226/228	Total Number of Containers	Special Instructions/Note:
River Seep - 08-071318	7/13/18	0750	G	Water	X	X	X	X	X	X	5	pH 7.09
River Seep - 13-071318	7/13/18	0915	G	Water	X	X	X	X	X	X	5	7.37
River Seep - 16-071318	7/13/18	1100	G	Water	X	X	X	X	X	X	3	7.46
River Seep - 14-071318	7/13/18	1010	G	Water	X	X	X	X	X	X	3	7.54
River Seep - 04-071218	7/12/18	1350	G	Water	X	X	X	X	X	X	5	5.13
River Seep - 07-071218	7/12/18	1450	G	Water	X	X	X	X	X	X	5	7.27
River Seep - 05-071218	7/12/18	1425	G	Water	X	X	X	X	X	X	5	6.92
Landfill Seep - 01-071318	7/13/18	1320	G	Water	X	X	X	X	X	X	5	10.64
Landfill Seep - 01-071318 - Dup	7/13/18	1320	G	Water	X	X	X	X	X	X	5	10.64
Landfill Seep - 02-071318	7/13/18	1310	G	Water	X	X	X	X	X	X	5	10.20
Landfill Seep - 03-071318	7/13/18	1330	G	Water	X	X	X	X	X	X	5	9.02

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months
 Special Instructions/QC Requirements:
 Deliverable Requested: Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological
 Empty Kit Relinquished by: _____ Date: _____ Time: _____
 Relinquished by: _____ Date/Time: **7/13/18 1630** Company: **AECOM**
 Relinquished by: _____ Date/Time: _____ Company: _____
 Relinquished by: _____ Date/Time: _____ Company: _____
 Custody Seal No.: _____ Custody Seal No.: _____
 Cooler Temperature(s) °C and Other Remarks: **5.7, 1.0, 3.1**

TestAmerica Nashville
 2960 Foster Creighton Drive
 Nashville, TN 37204
 Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information Client Contact: Greg Dick Company: Big Rivers Electric Corporation Address: PO BOX 24 City: Henderson State, Zip: KY, 42419 Phone: 270-844-6010(Tel) Email: Gregory.Dick@bigrivers.com Project Name: Big Rivers Electric Corp - Henderson KY Site: <u>Sabree Green Landfill</u>		Lab PIV: Cisneros, Roxanne E-Mail: roxanne.cisneros@testamericainc.com Carner Tracking No(s): <u>3000215</u>		COC No: 490-86693-251731 Page: Page 1 of 2 Job #:	
Sampler: <u>Chris Davis</u> Phone: <u>513-237-1184</u>		Analysis Requested:		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: <u>CCR App II, IV + A1k, Nc, Mg</u>	
Due Date Requested: <u>Standard</u> TAT Requested (days): <u>Standard</u> PO #: <u>Purchase Order - see DOCs</u> WO #:		Total Number of Containers:		Special Instructions/Note: <u>PH 7.95</u> <u>PH 10.71</u>	
Sample Identification: <u>POND -018 - 071318</u> <u>Landfill Seep - 04 - 071318</u> <u>Tracer Seep - 16 - 071318 OS</u>		Field Filtered Sample (Yes or No): X N D N A		Loc: 490 155661	
Sample Date: <u>7/13/18</u> <u>7/13/18</u> <u>7/13/18</u>		Sample Time: <u>1350</u> <u>1415</u> <u>1054</u>		Matrix (W-water, S-solid, O-organic, N-nutrient, A-Air) Water Water Water Water Water Water Water Water Water	
Sample Type (C-Comp, G-grab) <u>6</u> <u>6</u>		Preservation Code: N N N		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)		Method of Shipment:		Received by: <u>[Signature]</u> Date/Time: <u>7/14/18 10:50</u> Company: <u>TA-CAS</u>	
Empty Kit Relinquished by:		Date:		Received by: <u>[Signature]</u> Date/Time: <u>5/7/10, 3.1</u> Company:	
Relinquished by: <u>[Signature]</u> Date/Time: <u>7/13/18 1630</u> Company: <u>AECON</u>		Relinquished by:		Relinquished by:	
Custody Seals Intact: <u>Yes</u> <input type="checkbox"/> No <input type="checkbox"/> Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		Ver: 08/04/2016	



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Chain of Custody Record



THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Sampler:	Lab Pk:	Carrier/Tracking No(s):	COC No:					
Client Contact:		Phone:	Cisneros, Roxanne		490-75464.1					
Shipping/Receiving:		E-Mail:	roxanne.cisneros@lestamerica.com	State of Origin:	Page 1 of 2					
Company:		TestAmerica Laboratories, Inc.		Kentucky	Page 1 of 2					
Address:		13715 Rider Trail North,	Accreditations Required (See note):	State Program - Kentucky (UST)	Job #:					
City:		Earth City			490-155661-2					
State, Zip:		MO, 63045								
Phone:		314-298-8566(Tel) 314-298-8757(Fax)								
Email:		WO #:								
Project Name:		Project #:								
Big Rivers Electric Corp - CCR & Semiam		49010431								
Site:		SSOW#:								
Big Rivers CCR										
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix (W=Water, S=Solid, O=Water/Solid, B=Issue Anal)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested	Total Number of containers	Special Instructions/Note:
River Seep-08-071318 (490-155661-1)	7/13/18	07:50	Central	Water		X	X	X	run once - upload data twice	
River Seep-12-071318 (490-155661-2)	7/13/18	09:15	Central	Water		X	X	X	run once - upload data twice	
River Seep-09-071218 (490-155661-5)	7/12/18	13:50	Central	Water		X	X	X	run once - upload data twice	
River Seep-07-071218 (490-155661-6)	7/12/18	14:50	Central	Water		X	X	X	run once - upload data twice	
River Seep-05-071218 (490-155661-7)	7/12/18	14:25	Central	Water		X	X	X	run once - upload data twice	
Landfill Seep-01-071318 (490-155661-8)	7/13/18	12:20	Central	Water		X	X	X	run once - upload data twice	
Landfill Seep-01-071318-DUP (490-155661-9)	7/13/18	13:10	Central	Water		X	X	X	run once - upload data twice	
Landfill Seep-02-071318 (490-155661-10)	7/13/18	13:10	Central	Water		X	X	X	run once - upload data twice	
Landfill Seep-03-071318 (490-155661-11)	7/13/18	13:30	Central	Water		X	X	X	run once - upload data twice	
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica Laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.</p>										
Possible Hazard Identification										
Unconfirmed										
Deliverable Requested: I, II, III, IV, Other (Specify)										
Primary Deliverable Rank: 2										
Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:						
Relinquished by:		Date/Time:								
Relinquished by:		Date/Time:								
Relinquished by:		Date/Time:								
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:						
A Yes A No				18.5						

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Nashville, TN 37204
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Chain of Custody Record

490-155661

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)
Client Contact: TestAmerica Laboratories, Inc.
Shipping/Receiving:
Company: TestAmerica Laboratories, Inc.
Address: 13715 Rider Trail North,
City: TAT Requested (days):
State, zip: MO, 63045
Phone: 314-298-8566(Tel) 314-298-8757(Fax)
Email:
Project Name: Big Rivers Electric Corp - CCR & SemiAnn
Site: Big Rivers CCR
Sample: Cismenos, Roxanne
Phone:
E-Mail: roxanne.cismenos@lestamericainc.com
Accreditations Required (See note): State Program - Kentucky (UST)

Date Date Requested: 8/13/2018
TAT Requested (days):
Field Filtered Sample (Yes or No)
Perform MS/MSD (Yes or No)
903.0/PrecSep_21 Standard Target List
904.0/PrecSep_0 Standard Target List
Ra226Ra228_GFPC
Analysis Requested
Total Number of containers

Table with columns: Sample ID (Lab ID), Sample Date, Sample Time, Sample Type (C=Comp, G=grab), Matrix (W=water, S=solid, O=material, B1=issue, A=oil), Field Filtered Sample (Yes or No), Perform MS/MSD (Yes or No), Special Instructions/Note.

Table with columns: Sample ID (Lab ID), Sample Date, Sample Time, Sample Type, Matrix, Field Filtered Sample, Perform MS/MSD, Total Number of containers, Special Instructions/Note.

Possible Hazard Identification
Unconfirmed
Deliverable Requested: I, II, III, IV, Other (specify)
Primary Deliverable Rank: 2
Empty Kit Relinquished by:
Relinquished by:
Relinquished by:
Custody Seats Intact: A Yes A No
Custody Seal No.:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return To Client
Disposal By Lab
Archive For
Months
Received by:
Received by:
Date/Time:
Date/Time:
Date/Time:
Date/Time:
Company:
Company:
Company:
Company:

Method of Shipment:
Cooler Temperature(s) °C and Other Remarks:
Ver: (09/20/2016)

Login Sample Receipt Checklist

Client: Big Rivers Electric Corporation

Job Number: 490-155661-2

Login Number: 155661

List Number: 3

Creator: McBride, Mike

List Source: TestAmerica St. Louis

List Creation: 07/17/18 05:06 PM

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

Tracer/Carrier Summary

Client: Big Rivers Electric Corporation
 Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Percent Yield (Acceptance Limits)			
400-156511-B-1-B DU	Duplicate	90.3				
490-155661-1	River Seep-08-071318	87.3				
490-155661-2	River Seep-12-071318	92.9				
490-155661-5	River Seep-09-071218	89.4				
490-155661-6	River Seep-07-071218	79.4				
490-155661-7	River Seep-05-071218	82.9				
490-155661-8	Landfill Seep-01-071318	87.6				
490-155661-9	Landfill Seep-01-071318-DUP	94.4				
490-155661-10	Landfill Seep-02-071318	96.8				
490-155661-11	Landfill Seep-03-071318	89.7				
490-155661-12	Pond-012-071318	93.2				
490-155661-13	Landfill Seep-04-071318	97.6				
600-169468-C-1-A DU	Duplicate	94.4				
LCS 160-376745/1-A	Lab Control Sample	100				
LCS 160-376796/1-A	Lab Control Sample	99.7				
LCS 160-377701/1-A	Lab Control Sample	94.1				
LCSD 160-376745/2-A	Lab Control Sample Dup	100				
MB 160-376745/23-A	Method Blank	97.1				
MB 160-376796/18-A	Method Blank	102				
MB 160-377701/16-A	Method Blank	94.7				

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)	Percent Yield (Acceptance Limits)			
400-156511-B-1-D DU	Duplicate	90.3	84.5				
490-155661-1	River Seep-08-071318	87.3	90.5				
490-155661-2	River Seep-12-071318	92.9	85.6				
490-155661-5	River Seep-09-071218	89.4	87.1				
490-155661-6	River Seep-07-071218	79.4	87.1				
490-155661-7	River Seep-05-071218	82.9	83.0				
490-155661-8	Landfill Seep-01-071318	87.6	75.9				
490-155661-9	Landfill Seep-01-071318-DUP	94.4	94.6				
490-155661-10	Landfill Seep-02-071318	96.8	85.6				
490-155661-11	Landfill Seep-03-071318	89.7	92.7				
490-155661-12	Pond-012-071318	93.2	77.8				
490-155661-13	Landfill Seep-04-071318	97.6	86.4				
600-169468-C-1-B DU	Duplicate	94.4	90.8				
LCS 160-376750/1-A	Lab Control Sample	100	86.4				
LCS 160-376805/1-A	Lab Control Sample	99.7	91.2				
LCS 160-377705/1-A	Lab Control Sample	94.1	88.6				
LCSD 160-376750/2-A	Lab Control Sample Dup	100	87.5				
MB 160-376750/23-A	Method Blank	97.1	85.6				
MB 160-376805/18-A	Method Blank	102	91.6				

TestAmerica Nashville

Tracer/Carrier Summary

Client: Big Rivers Electric Corporation
Project/Site: Sebree-Green Landfill

TestAmerica Job ID: 490-155661-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
MB 160-377705/16-A	Method Blank	94.7	90.1

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14