PRELIMINARY DETERMINATION

PERMIT RENEWAL
Black Warrior Solid Waste Disposal Authority
3301 Landfill Drive
Coker, Alabama 35452

Black Warrior Solid Waste Disposal Facility
Permit No. 63-01

June 1, 2022

CDG Engineers & Associates, on behalf of Black Warrior Solid Waste Disposal Authority has submitted to the Alabama Department of Environmental Management (ADEM) an application to continue to operate a municipal solid waste landfill known as the Black Warrior Solid Waste Disposal Facility (Permit No. 63-01). The waste stream for the Black Warrior Solid Waste Disposal Facility would remain nonhazardous solid wastes, noninfectious putrescible and nonputrescible wastes including but not limited to household garbage, industrial waste, construction and demolition debris, commercial waste, appliances, tires, trees, limbs, stumps, dried sludge, ashes, paper and other similar type materials. Special waste approved by ADEM may also be accepted. The service area for the Black Warrior Solid Waste Disposal Facility would remain the State of Alabama. The maximum average daily volume of waste disposed at the Black Warrior Solid Waste Disposal Facility would remain 1500 tons per day. All previously approved variances and special conditions were requested and would be granted in the renewed permit. All other permit conditions would remain the same.

The Black Warrior Solid Waste Disposal Facility is located in Sections 2 and 11, Township 21 South, Range 11 West in Tuscaloosa County, Alabama. The Black Warrior Solid Waste Disposal Facility consists of 226.48 acres with 127.96 acres for disposal operations.

The Land Division has determined that the permit renewal meets the applicable requirements of ADEM's Administrative Codes Division 13.

Technical Contact:

Hunter Baker
Solid Waste Engineering Section
Land Division
(334) 270-5607

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

SOLID WASTE DISPOSAL FACILITY PERMIT

PERMITTEE:	**Black Warrior Solid Waste Disposal Authority**
FACILITY NAME:	**Black Warrior Solid Waste Disposal Facility**
FACILITY LOCATION:	**Sections 2 and 11, Township 21 South, Range 11 West, in Tuscaloosa County, Alabama, comprising 226.48 acres with a disposal area of 127.96 acres.**
PERMIT NUMBER:	**63-01**
WASTE APPROVED FOR DISPOSAL:	**Nonhazardous solid wastes, noninfectious putrescible and nonputrescible wastes including but not limited to household garbage, industrial waste, construction and demolition debris, commercial waste, appliances, tires, trees, limbs, stumps, dried sludge, ashes, paper and other similar type materials. Special waste approved by ADEM may also be accepted.**
APPROVED WASTE VOLUME:	**Maximum Average Daily Volume of 1,500 tons per day**
APPROVED SERVICE AREA:	**State of Alabama**

In accordance with and subject to the provisions of the Alabama Solid Wastes and Recyclable Materials Management Act, as amended, Code of Alabama 1975, SS 22-27-1 to 22-27-27 ("SWRMMA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, SS 22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to dispose of the above-described solid wastes at the above-described facility location.

ISSUANCE DATE:	**?????**
EFFECTIVE DATE:	**?????**
EXPIRATION DATE:	**?????**

Alabama Department of Environmental Management

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
SOLID WASTE PERMIT

Permittee:	Black Warrior Solid Waste Disposal Authority 3301 Landfill Drive Coker, Alabama 35452
Landfill Name:	Black Warrior Solid Waste Disposal Facility
Landfill Location:	Sections 2 and 11, Township 21 South, Range 11 West Tuscaloosa County, Alabama
Permit No.	63-01
Landfill Type:	Municipal Solid Waste

Pursuant to the Solid Wastes and Recyclable Materials Management Act, Code of Alabama 1975, §§22-27-1, et seq., as amended, and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM), this permit is issued to Black Warrior Solid Waste Disposal Authority (hereinafter called the Permittee), to operate a solid waste disposal facility, known as the Black Warrior Solid Waste Disposal Facility.

The Permittee must comply with all terms and conditions of this permit. This permit consists of the conditions set forth herein (including those in all attachments), and the applicable regulations contained in Chapters 335-13-1 through 335-13-16 of the ADEM Administrative Code (referred to as the "ADEM Admin. Code" or "335-13"). Rules cited are set forth in this document for the purpose of Permittee reference. A Rule that is cited incorrectly in this document does not constitute grounds for noncompliance on the part of the Permittee. Applicable ADEM Administrative Codes are those that are in effect on the date of issuance of this permit or the revisions approved after permit issuance.

This permit is based on the information submitted to ADEM on October 1, 2021, and as amended for permit renewal, and is hereby known as the Permit Application (hereby incorporated by reference and hereinafter referred to as the Application). Inaccuracies found in this information could lead to the termination or modification of this permit and potential enforcement action. The Permittee must inform ADEM of deviations from or changes in the information in the Application that would affect the Permittee's ability to comply with the applicable ADEM Admin. Code or permit conditions.

This permit is effective as of **???????**, and shall remain in effect until **???????**, unless suspended or revoked.

_____ _____

Alabama Department of Environmental Management Date Signed

SECTION I. STANDARD CONDITIONS.

A. Effect of Permit. The Permittee is allowed to dispose of nonhazardous solid waste in accordance with the conditions of this permit and 335-13. Issuance of this permit does not convey property rights of any sort or an exclusive privilege, nor does it authorize the injury to persons or property, the invasion of other private rights, or the infringement of state or local laws or regulations. Except for actions brought under Code of Alabama 1975, §§22-27-1, *et seq*., as amended, compliance with the conditions of this permit shall be deemed to be compliance with applicable requirements in effect as of the date of issuance of this permit and future revisions.

B. Permit Actions. This permit may be suspended, revoked or modified for cause. The filing of a request for a permit modification or the notification of planned changes or anticipated noncompliance on the part of the Permittee, and the suspension or revocation does not stay the applicability or enforceability of permit condition.

C. Severability. The provisions of this permit are severable, and if a provision of this permit, or the application of a provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

D. Definitions. For the purpose of this permit, terms used herein shall have the same meaning as those in 335-13, unless this permit specifically provides otherwise; where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

1. "EPA" means the United States Environmental Protection Agency.

2. "Permit Application" means all permit application forms, design plans, operational plans, closure plans, technical data, reports, specifications, plats, geological and hydrological reports, and other materials which are submitted to ADEM in pursuit of a solid waste disposal permit.

E. Duties and Requirements.

1. Duty to Comply. The Permittee must comply with all conditions of this permit except to the extent and for the duration such noncompliance is authorized by a variance granted by ADEM. A permit noncompliance, other than noncompliance authorized by a variance, constitutes a violation of Code of Alabama 1975, §§22-27-1 et seq., as amended, and is grounds for enforcement action, permit suspension, revocation, modification, and/or denial of a permit renewal application.

2. Duty to Reapply. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The renewal application must be submitted to ADEM at least 180 days before this permit expires.

3. Permit Expiration. This permit and all conditions therein will remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application as required by Section I.E.2., and, through no fault of the Permittee, ADEM has not made a final decision regarding the renewal application.

4. Need to Halt or Reduce Activity Not A Defense. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit.

5. Duty to Mitigate. In the event of noncompliance with this permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

6. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of control (and related appurtenances) that are installed or used by the Permittee to achieve compliance with the conditions of this permit.

7. Duty to Provide Information. If requested, the Permittee shall furnish to ADEM, within a reasonable time, the information that ADEM may reasonably need to determine whether cause exists for denying, suspending, revoking, or modifying this permit, or to determine compliance with this permit. If requested, the Permittee shall also furnish ADEM with copies of records kept as a requirement of this permit.

8. Inspection and Entry. Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow the employees of ADEM or their authorized representative to:

   a. Enter at reasonable times the Permittee's premises where the regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

   b. Have access to and copy, at reasonable times, the records that must be kept under the conditions of this permit.

   c. Inspect, at reasonable times, the facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

   d. Sample or monitor, at reasonable times, the substances or parameters at a location for the purposes of assuring permit compliance or as otherwise authorized by Code of Alabama 1975, §§22-27-1 *et seq*.

9. Monitoring, Corrective Actions, and Records.

   a. Samples and measurements taken for the purpose of monitoring or corrective action shall be representative of the monitored activity. The methods used to obtain representative samples to be analyzed must be the appropriate method from 335-13-4 or the methods as specified in the Application attached hereto and incorporated by reference. Laboratory methods must be those specified in Standard Methods for the Examination of Water and Wastewater (American Public Health Association, latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Publication SW-846, latest edition), other appropriate EPA methods, or as specified in the Application. All field tests must be conducted using approved EPA test kits and procedures.

   b. The Permittee shall retain records, at the location specified in Section I.I., of all monitoring, or corrective action information, including all calibration and maintenance records, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit for a period of at least three years from the date of the sample, measurement, report or record or for periods elsewhere specified in this permit. These periods may be extended by the request of ADEM at any time and are automatically extended during the course of an unresolved enforcement action regarding this facility.

   c. Records of monitoring and corrective action information shall include.

      i. The exact place, date, and time of sampling or measurement.

      ii. The individual(s) and company who performed the sampling or measurements.

      iii. The date(s) analyses were performed.

      iv. The individual(s) and company who performed the analyses.

v. The analytical techniques or methods used.

vi. The results of such analyses.

d. The Permittee shall submit all monitoring and corrective action results at the interval specified elsewhere in this permit.

10. Reporting Planned Changes. The Permittee shall notify ADEM, in the form of a request for permit modification, at least 120 days prior to a change in the permitted service area, increase in the waste received, or change in the design or operating procedure as described in this permit, including planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

11. Transfer of Permit. This permit may be transferred to a new owner or operator. All requests for transfer of permits shall be in writing and shall be submitted on forms provided by ADEM. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of this permit.

12. Certification of Construction. The Permittee may not commence disposal of waste in a new cell or phase until the Permittee has submitted to ADEM, by certified mail or hand delivery, a letter signed by both the Permittee and a professional engineer stating that the facility has been constructed in compliance with the permit. An engineer must attest or certify that the installation, seaming, etc., as proposed or as depicted on the plan or layout specified above would meet the standards or criteria prescribed, or required by the manufacturers of the components and ADEM's regulations, and that the panels or components would be expected to perform satisfactorily, without failure, to the required standards over a normally expected lifetime or performance period for typical panels or components. ADEM must inspect the constructed cells or phases before the owner or operator can commence waste disposal unless the Permittee is notified that ADEM will waive the inspection.

13. Compliance Schedules. Reports of compliance or noncompliance with or progress reports on interim and final requirements contained in a compliance schedule required and approved by ADEM shall be submitted no later than 14 days following each schedule date.

14. Other Noncompliance. The Permittee shall report all instances of noncompliance with the permit at the time monitoring reports are submitted.

15. Other Information. If the Permittee becomes aware that information required by the Application was not submitted or was incorrect in the Application or in a report to ADEM, the Permittee shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to ADEM, within a reasonable time, information related to compliance with the permit.

F. Design and Operation of Facility. The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or an unplanned sudden or nonsudden release of contaminants (including leachate and explosive gases) to air, soil, groundwater, or surface water, which could threaten human health or the environment.

G. Inspection Requirements.

1. The Permittee shall comply with all requirements set forth under 335-13.

2. The Permittee shall conduct random inspections of incoming loads.

3. Records of all inspections shall be included in the operating record.

H. Recordkeeping and Reporting.

1. The Permittee shall maintain a written operating record at the location specified in Section I.I. The operating record shall include:

   a. Documentation of inspection and maintenance activities.

   b. Daily Volume reports.

   c. Personnel training documents and records.

   d. Solid/Hazardous Waste Determination Forms for Industrial Wastes, and associated ADEM disposal approval correspondence for special wastes, industrial wastes, etc.

   e. Groundwater monitoring records.

   f. Explosive gas monitoring records.

   g. Surface water and leachate monitoring records. Leachate monitoring must be performed before transporting to a publicly owned treatment works. Monitoring is subject to applicable conditions of Section VII. of the permit.

   h. Copies of this Permit and the Application.

   i. Copies of all variances granted by ADEM, including copies of all approvals of special operating conditions (such as approvals for open burning,).

2. Quarterly Volume Report. Beginning with the effective date of this permit, the Permittee shall submit, within thirty (30) days after the end of each calendar quarter, a report summarizing the daily waste receipts for the previous (just ended) quarter. Copies of the quarterly reports shall be maintained in the operating record.

3. Monitoring and Corrective Action Reports. The Permittee shall submit reports on all monitoring and corrective activities conducted pursuant to the requirements of this permit, including, but not limited to, groundwater, surface water, explosive gas and leachate monitoring. The groundwater monitoring shall be conducted in March and September of each year and the reports shall be submitted at least semi-annually. The reports should contain all monitoring results and conclusions from samples and measurements conducted during the sampling period. Explosive gas monitoring must be submitted on a quarterly basis, and the reports should be submitted to ADEM and placed in the operating record within 30 days of the monitoring event. Copies of the semi-annual groundwater and quarterly explosive gas monitoring reports shall be maintained in the operating record.

4. Availability, Retention, and Disposition of Records.

   a. All records, including plans, required under this permit or 335-13 must be furnished upon request, and made available at reasonable times for inspection by an officer, employee, or representative of ADEM.

   b. All records, including plans, required under this permit or 335-13 shall be retained by the Permittee for a period of at least three years. The retention period for all records is extended automatically during the course of an unresolved enforcement action regarding the facility, or as requested by ADEM.

   c. A copy of records of waste disposal locations and quantities must be submitted to ADEM and local land authority upon closure of the facility.

I. Documents to be Maintained by the Permittee. The Permittee shall maintain at Black Warrior Solid Waste Disposal Facility the following documents and amendments, revisions and modifications to these documents until an engineer certifies closure:

1. Operating record.

2. Closure Plan.

J. Mailing Location. All reports, notifications, or other submissions which are required by this permit should be sent via signed mail (i.e. certified mail, express mail delivery service, etc.) or hand delivered to:

1. Mailing Address.
Chief, Land Division
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, AL 36130-1463

2. Physical Address.
Chief, Land Division
Alabama Department of Environmental Management
1400 Coliseum Blvd.
Montgomery, Alabama 36110-2400

K. Signatory Requirement. All applications, reports or information required by this permit, or otherwise submitted to ADEM, shall be signed and certified by the owner as follows:

1. If an individual, by the applicant.

2. If a city, county, or other municipality or governmental entity, by the ranking elected official, or by a duly authorized representative of that person.

3. If a corporation, organization, or other legal entity, by a principal executive officer, of at least the level of Vice President, or by a duly authorized representative of that person.

L. Confidential Information. The Permittee may claim information submitted as confidential if the information is protected under Code of Alabama 1975 §22-39-18, as amended.

M. State Laws and Regulations. Nothing in this permit shall be construed to preclude the initiation of a legal action or to relieve the Permittee from the responsibilities, liabilities, or penalties established pursuant to an applicable state law or regulation.

SECTION II. GENERAL OPERATING CONDITIONS.

A. Operation of Facility. The Permittee shall operate and maintain the disposal facility consistent with the Application, this permit, and 335-13.

B. Open Burning. The Permittee shall not allow open burning without prior written approval from ADEM and other appropriate agencies. A burn request should be submitted in writing to ADEM outlining why that burn request should be granted. This request should include, but not be limited to, specifically what areas will be utilized, types of waste to be burned, the projected starting and completion dates for the project, and the projected days and hours of operation. The approval, if granted, shall be included in the operating record.

C. Prevention of Unauthorized Disposal. The Permittee shall follow the approved procedures for the detecting and preventing the disposal of free liquids, regulated hazardous waste, PCB's, and medical waste at the facility.

D. Unauthorized Discharge. The Permittee shall operate the disposal facility in such a manner that there will be no water pollution or unauthorized discharge. A discharge from the disposal facility or practice thereof may require a National Pollutant Discharge Elimination System permit under the Alabama Water Pollution Control Act.

E. Industrial and Medical Waste Disposal. The Permittee shall dispose of industrial process waste as required by 335-13, and as specified in the Application. The Permittee, prior to disposal of industrial waste and/or medical waste, shall obtain from each generator a written certification that the material to be disposed does not contain free liquids, regulated hazardous wastes, regulated medical waste, or regulated PCB wastes.

F. Boundary Markers. The Permittee shall ensure that the facility is identified with a sufficient number of permanent boundary markers that are at least visible from one marker to the next.

G. Certified Operator. The Permittee shall be required to have an operator certified by the Department on-site during hours of operation, in accordance with the requirements of ADEM Admin. Code 335-13-12.

SECTION III. SPECIFIC MSW LANDFILL REQUIREMENTS.

A. Waste Identification and Management.

1. Subject to the terms of this permit, the Permittee may dispose of the nonhazardous solid wastes listed in Section III.B. Disposal of other waste streams is prohibited, except waste that is granted a temporary or one-time waiver by the Director.

2. The permitted facility boundary for the Black Warrior Solid Waste Disposal Facility is approximately 226.48 acres with a solid waste disposal area of 127.96 acres.

3. The maximum average daily volume of waste disposed at the facility, as contained in the permit application, shall not exceed 1500 tons/day. Should the average daily volume exceed this value by 20% or 100 tons/day, whichever is less, for two (2) consecutive quarters the permittee shall be required to modify the permit in accordance with 335-13-5-.06(2)(b)2. An increase in maximum average daily volume shall not be approved by ADEM unless the permittee has received local approval for the increased maximum average daily volume. The average daily volume shall be computed as specified by 335-13-4-.22(2)(g).

B. Waste Streams. The Permittee may accept for disposal nonhazardous solid wastes, noninfectious putrescible and nonputrescible wastes including but not limited to household garbage, industrial waste, construction and demolition debris, commercial waste, appliances, tires, trees, limbs, stumps, dried sludge, ashes, paper and other similar type materials. Special waste approved by ADEM may also be accepted.

C. Service Area. The service area for this landfill shall be all counties in Alabama.

D. Special Waste. The Permittee may dispose of special wastes in accordance with 335-13.

1. Asbestos Waste. The Permittee shall dispose of asbestos waste in accordance with 335-13-4-.26.

2. Foundry Sand. The Permittee shall dispose of foundry waste in accordance with 335-13-4-.26.

3. Petroleum Contaminated Waste. The Permittee shall dispose of petroleum contaminated waste in accordance with 335-13-4-.26.

4. Municipal Solid Waste Ash. The Permittee shall dispose of municipal solid waste ash in accordance with 335-13-4-.26.

E. Liner Requirements. The Permittee shall install a composite liner system as described in the Application consisting of a minimum of two feet of clay with a hydraulic conductivity of 1×10^{-7} cm/sec of less, overlain by a textured 60 mil. High Density Polyethylene (HDPE). The 60 mil. HDPE will be overlain with either an HDPE drainage net overlain with a geotextile filter fabric and two feet of on site soil cover or with one foot of sand with a hydraulic conductivity of 2×10^{-2} cm/sec or greater and one foot of on site material. The base of the composite liner system shall be a minimum of five (5) feet above the highest measured groundwater level as determined by 335-13-.4-.11(2)a.

F Septic Tank Pumpings and Sewage Sludge. The Permittee shall not dispose of septic tank pumpings and/or sewage sludge unless specifically approved in writing by ADEM.

G. Large Dead Animals and Highly Putrescible Wastes. The Permittee shall handle the disposal of large dead animals and/or highly putrescible waste as required by 335-13-4-.22(1)(j). Disposal is allowed only in the municipal solid waste disposal area.

H. Cover Requirements. The Permittee shall cover all wastes as required by 335-13. The Permittee has been approved to utilize commercial tarp systems (See Section X., 2.) and non-hazardous solid waste clarifier sludge, cooling tower sludge, and steckle dust all generated from NUCOR Steel Tuscaloosa, Inc. (See Section X., 3.) as an alternate daily cover. The Permittee shall be required to cover the active cell with six inches of earthen cover at the conclusion of each week's activities.

I. Waste Compaction. All waste shall be thoroughly compacted with adequate landfill equipment before the daily or weekly cover is applied. A completed daily cell shall not exceed fifteen feet in vertical thickness measured perpendicular to the slope of the preceding cell (See Section X., 1.).

J. Daily Cells. All waste shall be confined to an area as small as possible within a single working face and spread to a depth not exceeding two feet prior to compaction, and such compaction shall be accomplished on a face slope not to exceed 4 to 1or as otherwise approved by ADEM.

K. Security. The Permittee shall provide artificial and/or natural barriers, which prevent entry of unauthorized vehicular traffic to the facility.

L. All Weather Access Roads. The Permittee shall provide an all-weather access road to the dumping face that is wide enough to allow passage of collection vehicles.

M. Adverse Weather Disposal. The Permittee shall provide for disposal activities in adverse weather conditions.

N. Personnel. The Permittee shall maintain adequate personnel to ensure continued and smooth operation of the facility.

O. Equipment. The Permittee shall provide the landfill equipment as required by 335-13-4-.22(1)(f).

P. Environmental Monitoring and Treatment Structures. The Permittee shall provide protection and proper maintenance of environmental monitoring and treatment structures.

Q. Vector Control. The Permittee shall provide for vector control as required by 335-13.

R. Bulk or Noncontainerized Liquid Waste. The Permittee shall not dispose of bulk or noncontainerized liquid waste, or containers capable of holding liquids, unless the conditions of 335-13-4-.22(1)(k) are met.

S. Empty Containers. The Permittee shall render empty containers larger than normally found in household waste unsuitable for holding liquids prior to delivery to the landfill unit unless otherwise approved by ADEM.

T. Other Requirements. ADEM may enhance or reduce the requirements for operating and maintaining the landfill as deemed necessary by the Land Division.

U. Other Permits. The Permittee shall operate the landfill according to this and other applicable permits.

V. Scavenging and Salvaging Operations. The Permittee shall prevent scavenging and salvaging operations, except as part of a controlled recycling effort.

W. Signs. The Permittee shall provide a sign outlining instructions for use of the site. The sign shall be posted and have the information required by 335-13-4-.22(1)(i).

X. Litter Control. The Permittee shall control litter.

Y. Fire Control. The Permittee shall provide fire control measures.

SECTION IV. GROUNDWATER MONITORING REQUIREMENTS.

A. The Permittee shall install and/or maintain a groundwater monitoring system, as specified below.

1. The permittee shall maintain the groundwater monitoring wells and piezometers identified in Table 1 at the locations specified in the Application, and any other groundwater monitoring wells which are added during the active life and the post closure care period.

2. The Permittee shall install and maintain additional groundwater monitoring wells as necessary to assess changes in the rate and extent of a plume of contamination or as otherwise deemed necessary to maintain compliance with the 335-13.

3. Prior to installing additional groundwater monitoring wells, the Permittee shall submit a report to ADEM with a permit modification request specifying the design, location and installation of additional monitoring wells. This report shall be submitted within one hundred and twenty (120) days prior to the installation which, at a minimum, shall include.

    a. Well construction techniques including proposed casing depths, proposed total depth, and proposed screened interval of well(s);

    b. Well development method(s);

    c. A complete analysis of well construction materials;

    d. A schedule of implementation for construction; and

    e. Provisions for determining the lithologic characteristics, hydraulic conductivity and grain-size distribution for the applicable aquifer unit(s) at the location of the new well(s).

B. Groundwater Monitoring Requirements.

1. The Permittee shall determine the groundwater surface elevation at each monitoring well and piezometer identified in Table 1 each time the well or piezometer is sampled and at least semi-annually throughout the active life and post-closure care period.

2. The Permittee shall determine the groundwater flow rate and direction in the first zone of saturation at least annually or each time groundwater is sampled and submit as required by 335-13.

3. Prior to the initial receipt of waste at the facility, the Permittee shall sample, and analyze for the parameters listed in Appendix I of 335-13-4-.27, in all monitoring wells identified in Section IV.A.2. to establish background water quality and/or as directed by 335-13-4-.27(2)(j) and 335-13-4-.27(2)(a)(1). The records and results of this sampling and analysis activity shall be submitted to ADEM, within sixty (60) days of the date of sampling.

4. The Permittee shall sample, and analyze all monitoring wells identified in Table 1 for the parameters listed in Appendix I of 335-13-4-.27(3), on a semi-annual basis throughout the active life of the facility and the post-closure care period in accordance with 335-13-4-.27(3). Sampling shall be conducted during March and September of each year, beginning with the effective date of this permit. . The records and results of this sampling and analysis activity shall be submitted to ADEM, within ninety (90) days of the date of sampling.

5. In addition to the requirements of Sections IV., B.1., B.2., B.3. and B.4., the Permittee shall record water levels, mean sea level elevation measuring point, depth to water, and the results of field tests for pH and specific conductance at the time of sampling for each well.

6. The Permittee is approved for inter-well statistical methods as described by the Revised Groundwater Monitoring Plan, dated March 23, 2022.

C. Sampling and Analysis Procedures. The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the groundwater monitoring wells described in Section IV.A. to provide a reliable indication of the quality of the groundwater.

1. Samples shall be collected, preserved, and shipped (when shipped off-site for analysis) in accordance with the procedures specified in the Application. Monitoring wells shall be bailed or pumped to remove at least four times the well volume of water. Slow recharge wells shall be bailed until dry. Wells shall be allowed to recharge prior to sampling.

2. Samples shall be analyzed according to the procedures specified of the Application, Standard Methods for the Examination of Water and Wastewater (American Public Health Association, latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Publication SW-846, latest edition), or other appropriate methods approved by this Department. All field tests must be conducted using approved EPA test kits and procedures.

3. Samples shall be tracked and controlled using the chain-of-custody and QA/QC procedures specified of the Application.

D. Recordkeeping and Reporting Requirements.

1. Recording of Results. For each sample and/or measurement taken pursuant to the requirements of this permit, the Permittee shall record the information required by Section I.E.9.c.

2. Recordkeeping. Records and results of all groundwater monitoring, sampling, and analysis activities conducted pursuant to the requirements of this permit shall be included in the operating record required by Section I.I.1.

E. Permit Modification. If the Permittee or ADEM determines that the groundwater monitoring system no longer satisfies the requirements of 335-13-4-.14 or Section IV.A. of this permit, the Permittee must, within 120 days, submit an application for a permit modification to make necessary and/or appropriate changes to the system.

TABLE 1
GROUNDWATER MONITORING WELLS.

Monitoring Well Number	Top of Casing (feet msl)	Part Monitoring
	Upgradient Wells	
MW-1	280.92	Entire Landfill
MW-2	299.44	Entire Landfill
	Downgradient Wells	
MW-3R	272.25	Entire Landfill
MW-4	196.88	Entire Landfill
MW-5	225.02	Entire Landfill
MW-6	191.62	Entire Landfill
MW-7	199.56	Entire Landfill
MW-8	217.84	Entire Landfill
MW-9	270.14	Entire Landfill

SECTION V. GAS MONITORING REQUIREMENTS.

The Permittee must install and maintain an explosive gas monitoring system in accordance with ADEM Admin. Code Division 13.

SECTION VI. MUNICIPAL SOLID WASTE LANDFILL AIR EMISSIONS.

This landfill may be subject to ADEM Admin. Code Division 3 and the Federal Clean Air Act. Contact the ADEM Air Division for applicable requirements and permits.

SECTION VII. LEACHATE AND SURFACE WATER MANAGEMENT REQUIREMENTS.

The Permittee must collect and dispose of the leachate that is generated at the facility. The Permittee shall install a leachate collection system designed to maintain less than 12 inches (30 cm) depth of leachate over the liner. Prior to initial disposal, the permittee shall provide the Department with a letter from the receiving publicly or privately owned treatment works, approving the acceptance of the leachate. Discharges to publicly or privately owned treatment works may be subject to the requirements of the ADEM Water Division's State Indirect Discharge (SID) Program. The permittee shall construct and maintain run-on and run-off control structures. Surface water discharges from drainage control structures shall be permitted through the ADEM Water Division's National Pollutant Discharge Elimination System (NPDES) Program.

SECTION VIII. CLOSURE AND POST- CLOSURE REQUIREMENTS.

The Permittee shall close the landfill and perform post-closure care of the landfill in accordance with 335-13.

A. Final Cover. The landfill shall be closed in accordance with the approved application and 335-13.

B. Vegetative Cover. The Permittee shall establish a vegetative or other appropriate cover within 90 days after completion of final grading requirements in the Application. Preparation of a vegetative cover shall include, but not be limited to, the placement of seed, fertilizer, mulch, and water.

C. Notice of Intent. The Permittee shall place in the operating record and notify ADEM of their intent to close the landfill prior to beginning closure.

D. Completion of Closure Activities. The Permittee must complete closure activities of each landfill unit in accordance with the Closure Plan within 180 days of the last known receipt of waste.

E. Certification of Closure. Following closure of each unit, the Permittee must submit to ADEM a certification, signed by an engineer, verifying the closure has been completed according to the Closure Plan.

F. Post-Closure Care Period. Post-closure care activities shall be conducted after closure of each unit throughout the life of this permit and continuing for a period of thirty (30) years following closure of the facility. ADEM may shorten or extend the post-closure care period applicable to the solid waste disposal facility. The Permittee shall reapply in order to fulfill the post-closure care requirements of this permit.

G. Post-Closure Maintenance. The Permittee shall provide post closure maintenance of the facility to include regularly scheduled inspections. This shall include maintenance of the cover, vegetation, monitoring devices and pollution control equipment and correction of other deficiencies that may be observed by ADEM. Monitoring requirements shall continue throughout the post closure period as determined by ADEM unless all waste is removed and no unpermitted discharge to waters of the State have occurred.

H. Post-Closure Use of Property. The Permittee shall ensure that post closure use of the property never be allowed to disturb the integrity of the final cover, liner, or other components of the containment system. This shall preclude the growing of deep-rooted vegetation on the closed area.

I. Certification of Post-Closure. Following post-closure of each unit, the Permittee must submit to ADEM a certification, signed by an engineer, verifying the post-closure has been completed according to the Post-Closure Plan.

J. Notice in Deed to Property. The Permittee must provide documentation of compliance with the requirements of the Uniform Environmental Covenants Program in ADEM Admin. Code Division 335-5 and shall record a notation onto the land deed containing the property utilized for disposal within 90 days after permit expiration, revocation or when closure requirements are achieved as determined by ADEM as stated in the Application. This notation shall state that the land has been used as a solid waste disposal facility, the name of the Permittee, type of disposal activity, location of the disposal facility and beginning and closure dates of the disposal activity.

K. Recording Instrument. The Permittee shall submit a certified copy of the recording instrument to ADEM within 120 days after permit expiration, revocation, or as directed by ADEM as described in the Application.

L. Removal of Waste. If the Permittee or other person(s) wishes to remove waste, waste residues, the liner, or any contaminated soils, the owner must request and receive prior approval from ADEM.

SECTION IX. FINANCIAL ASSURANCE

A. The Permittee shall maintain detailed written cost estimates, in current dollars, at the landfill office and on file with ADEM in accordance with ADEM Admin. Code 335-13-4-.28.

B. All cost estimates must be updated annually as required by ADEM Admin Code 335-13-4-28.

C. The Permittee must place a copy of the financial assurance mechanism along with other items required by ADEM Admin. Code 335-13-4-28. into the landfill operating record and submitted to ADEM before the initial receipt of waste in the case of closure, post-closure care, or no later than 120 days after corrective action remedy has been selected.

D. The financial assurance mechanisms must ensure that funds will be available in a timely fashion when needed.

E. The financial assurance mechanisms must be legally valid, binding, and enforceable under state and federal law.

F. The Permittee shall demonstrate continuous compliance with ADEM Admin. Code 335-13-4-28. by providing documentation of financial assurance in at least the amount that equals or exceeds the cost estimate. Changes in the financial assurance mechanism must be approved by the Department.

G. The Permittee shall increase the closure, post-closure or corrective action cost estimates and the amount of financial assurance if changes in the closure, post-closure or correction action plans or landfill conditions increase the maximum cost.

H. The Permittee may reduce the amount of financial assurance by submitting justification and a revised estimate to ADEM for approval.

SECTION X. VARIANCES AND SPECIAL CONDITIONS.

1. A variance is granted for the Black Warrior Solid Waste Disposal Facility from Rule 335-13-4-.22(1)(c) which states that a completed daily cell shall not exceed eight feet in vertical thickness measured perpendicular to the slope of the preceding cell. Under this variance, a completed cell shall not exceed fifteen feet in vertical thickness measured perpendicular to the slope of the preceding cell (See Section III., I.).

2. The Permittee has been granted approved to utilize commercial tarp systems as an alternate daily cover. The commercial tarp system must be approved by the manufacturer for landfill use and the Permittee shall be required to follow manufacturer's recommendations for installation and removal of the tarp system. At the conclusion of each week's operation, the Permittee shall be required to cover all exposed waste with a minimum of six inches of compacted earth. (See Section III., H.)

3. The Permittee has been granted approval to utilize non-hazardous solid waste clarifier sludge, cooling tower sludge, and steckle dust all generated from NUCOR Steel Tuscaloosa, Inc. as an alternate daily cover. The clarifier sludge, cooling tower sludge, and steckle dust may only be used to cover interior slopes of the cells. All exterior slopes shall be covered with soil in accordance with the approved plans and permit. A minimum of six inches of clarifier sludge, cooling tower sludge, or steckle dust shall be applied as cover. The Permittee shall be required to cover the active cell with six inches of earthen cover at the conclusion of each week's activities. (See Section III., H.)

Any variance granted by the Department may be terminated by the Department whenever the Department finds, after notice and opportunity for hearing, that the petitioner is in violation of any requirement, condition, schedule, limitation or any other provision of the variance, or that operation under the variance does not meet the minimum requirements established by state and federal laws.

Permit Application

CDG

Engineering. Environmental. Answers.

1840 East Three Notch Street
Andalusia, AL 36421
Post Office Box 278
Andalusia, AL 36420
Tel (334) 222-9431
Fax (334) 222-4018

www.cdge.com

March 14, 2022

Mr. Hunter Baker
Permit Engineer
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, AL 36110

Re: Black Warrior Solid Waste Disposal Facility, Permit 63-01
Permit Renewal

Dear Mr. Baker,

On behalf of the Black Warrior Solid Waste Disposal Authority please find enclosed a revised Permit Form 439 for the renewal of the Black Warrior Solid Waste Disposal Facility, Permit No. 63-01.

The Permittee is requesting to extend all previously approved variances.

If you have any questions, please do not hesitate to call.

Sincerely,
CDG Engineers & Associates, Inc.

R. Daniel Wells, PE
Principal Engineer

Enc:
Attachment A: ADEM Permit Form 439

ALBERTVILLE
ANDALUSIA
AUBURN
DOTHAN
GADSDEN
HOOVER
HUNTSVILLE

PERMIT APPLICATION
SOLID WASTE DISPOSAL FACILITY
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
(Submit in Triplicate)

1. **Facility type:**
   - x **Municipal Solid Waste Landfill (MSWLF)**
   - ____ **Industrial Landfill (ILF)**
   - ____ **CCR Landfill (CCRLF)**
   - ____ **CCR Surface Impoundment (CCRSI)**
   - x **Other (explain)** Renewal

2. **Facility Name** Black Warrior Solid Waste Disposal Facility

3. **Applicant:**

   Name: Black Warrior Solid Waste Disposal Authority

   Address: 3301 Landfill Drive
   Coker, AL 35452

   Telephone: 205-339-7330

4. **Location: (include county highway map or USGS map)**

   Township 21 South **Range** 11 West
   Section 2 and 11 **County** Tuscaloosa

5. **Land Owner:**

   Name: Black Warrior Solid Waste Disposal Authority

   Address: 3301 Landfill Drive
   Coker, AL 35452

   Telephone: 205-339-7330

   (Attach copy of agreement from landowner if applicable.)

6. **Contact Person:**

Name Ken Thrasher

Position or Affiliation Executive Director

Address: 3301 Landfill Drive
Coker, AL 35452

Telephone: 205-339-7330

7. **Size of Facility:** 226.48 **Acres**

Size of Disposal Area(s): 127.96 **Acres**

8. **Identify proposed service area or specific industry that waste will be received from:**

State of Alabama

9. **Proposed maximum average daily volume to be received at landfill (choose one):**

1,500 **Tons/Day** _____ **Cubic Yards/Day**

10. **List all waste streams to be accepted at the facility (i.e., household solid waste, wood boiler ash, tires, trees, limbs, stumps, etc.):**

nonhazardous solid wastes, noninfectious putrescible and non-putrescible wastes including but not limited to household garbage, industrial waste, construction and demolition debris, commerical waste, appliances, tires, trees, limbs, stumps, dried sludge, ashes, paper and other similar type materials. Special waste approved by ADEM may also be accepted.

Ken Thrasher
SIGNATURE

March 14, 2022
DATE

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov
1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

February 14, 2022

CERTIFIED MAIL 9489 0090 0027 6203 5763 48
RETURN RECEIPT REQUESTED

Mr. Ken Thrasher
Black Warrior Solid Waste Disposal Authority
3301 Landfill Drive
Coker, AL 35452

RE: Hydrogeology Review
Black Warrior Solid Waste Disposal Facility
Permit 63-01

Dear Mr. Thrasher:

The Department has conducted a hydrogeology review for the referenced facility. After review of the Revised Groundwater Monitoring Plan (GWMP) and the March 2021 Groundwater Monitoring and Statistical Analysis Report (GWMR), the following comments were made:

1. Section 1.1.17 of the GWMP cites ADEM Code r. 335-13-4-.27(16)(c); however, it appears that the appropriate rule is 335-13-4-.27(2)(l) which requires the owner or operator to specify in writing one of the statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent. Clarification or revision is recommended.

2. Section 1.1.17 of the GWMP specifies that a tolerance or prediction interval procedure will be used to evaluate groundwater monitoring data. The GWMP should specify that the facility is currently using interwell statistical methods in which downgradient compliance concentrations in a given well are compared to upgradient background concentrations.

3. Trend testing is recommended in Chapter 17 of the Unified Guidance to identify those groundwater populations whose mean concentrations are not stationary over time. The GWMP should indicate that trend testing will be included in groundwater monitoring reports.

4. Section 1.1.19 of the GWMP states "If a groundwater constituent is detected at a level determined to represent an SSI (statistically significant increase) above background values and the SSI cannot be attributed to errors in sampling, laboratory analysis, statistical evaluation, or natural variation in groundwater quality, the facility is typically required to initiate (or continue) Detection Monitoring." However, according to ADEM Admin. Code r. 335-13-4-.27(3)(c)2., if the owner or operator determines that there is an SSI over background, an assessment monitoring program must be established. The GWMP should be revised to indicate that assessment monitoring will be conducted in the event of a confirmed SSI above background values.

5. The GWMR includes non-parametric confidence intervals constructed around the median for cobalt detected in compliance wells MW-6, MW-7, and MW-8 and for 1,1-dichloroethane and

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110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

1,2-dichloroethene-(cis) detected in monitoring well MW-8. Concentrations of 1,1-dichloroethane were non-detect prior to March 2011, and concentrations of 1,2-dichloroethene-(cis) were non-detect prior to April 2013, and fairly consistent detections of these two constituents appear to show a shift in concentration since these dates. According to Section 7.4.4 of the Unified Guidance, confidence limits constructed on changing data may be overly wide and not be reflective of a shift in contaminant distribution; therefore, it is recommended that future confidence limits for 1,1-dichloroethane and 1,2-dichloroethene-(cis) be computed using the most recent stable measurements.

The SSIs indicated for cobalt are likely the result of inadequate background data collected at low reporting limits and the simple substitution of non-detect data with zero. Concentrations of cobalt in monitoring wells MW-6, MW-7, and MW-8 were non-detect prior to September 2020, and historical results indicate that the reporting limit for cobalt was set at 50 µg /L. Section 15.1 of the Unified Guidance indicates that non-detect values higher than other quantified data should be removed. Therefore, it is recommended that all cobalt data collected at the site prior to September 2020 be removed and that 8 to 10 independent background observations be collected at the lower reporting limit prior to conducting statistical analysis for cobalt. It may be appropriate to analyze background samples for cobalt quarterly until an adequate background dataset is established.

In order for the Department to consider the permit renewal, please provide the suggested information within 30 days of receipt of this letter.

If you have any questions regarding this matter, please contact Hunter Baker of the Solid Waste Engineering Section at (334) 270-5607.

Sincerely,

Jared Kelly, Chief
Solid Waste Engineering Section
Land Division

JDK/hb

3516 Greensboro Avenue
Tuscaloosa, AL 35401
205.345.0816
www.TTLUSA.com

Transmitted via: Email (hunter.baker@adem.alabama.gov)

March 23, 2022

Mr. Hunter Baker
Compliance and Enforcement Section
Solid Waste Branch
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, Alabama 36110-7700

RE: Response to the ADEM comments, dated February 14, 2022
Black Warrior Solid Waste Disposal Authority
Permit No. 63-01
TTL Project No.: 600107003.22

Dear Mr. Baker:

On March 7, 2022, TTL, Inc. (TTL) received a copy of a letter addressed to Mr. Ken Thrasher with the Black Warrior Solid Waste Authority (BWSWA) from the Alabama Department of Environmental Management (ADEM) in regards to their review of the Revised Groundwater Monitoring Plan (GWMP), dated April 16, 2021, and the Groundwater Monitoring & Statistical Analysis Report for September 2021 (GWMR), dated October 8, 2021, for BWSWA. The ADEM's Comments are provided below along with the permittee's response.

Revised Groundwater Monitoring Plan (GWMP)

- **ADEM Comment No. 1**: Section 1.1.17 of the GWMP cites ADEM Code r. 335-13-4-.27(16)(c); however, it appears that the appropriate rule is 335-13-4-.27(2)(1) which requires the owner or operator to specify in writing one of the statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent. Clarification or revision is recommended.

  Permittee's Response: In accordance ADEM Admin. Code r. 335-13-4-.27(2)(1), the facility is currently and will continue to evaluate the compiled groundwater analytical data using the inter-well statistical approach. TTL will revise Section 1.1.17 of the GWMP to clarify the use of this statistical method in evaluating groundwater monitoring data.

- **ADEM Comment No. 2:** Section 1.1.17 of the GWMP specifies that a tolerance or prediction interval procedure will be used to evaluate groundwater monitoring data. The GWMP should specify that the facility is currently using inter-well statistical methods in which downgradient compliance concentrations in a given well are compared to upgradient background concentrations.

  Permittee's Response: TTL will revise Section 1.1.17 of the GWMP to clarify that the facility has historically evaluated and will continue to evaluate the compiled groundwater analytical data using the inter-well statistical approach in which downgradient compliance concentrations in a given well are compared to upgradient background concentrations.

- **ADEM Comment No. 3**: Trend Testing is recommended in Chapter 17 of the Unified Guidance to identify those groundwater populations whose mean concentrations are not stationary over time. The GWMP should indicate that trend testing will be included in groundwater monitoring reports.

  Permittee's Response: TTL concurs with the Department's recommendation and will revise the GWMP to include trend testing in accordance with the Unified Guidance. Furthermore, TTL will

ensure that trend tests, as outlined in Chapter 17 of the Unified Guidance, for each statistical exceedance is included in all future Groundwater Monitoring Reports (GWMRs).

- **ADEM Comment No. 4**: Section 1.1.19 of the GWMP states "If a groundwater constituent is detected at a level determined to represent an SSI (statistically significant increase) above background values and the SSI cannot be attributed to errors in sampling, laboratory analysis, statistical evaluation, or natural variation in groundwater quality, the facility is typically required to initiate (or continue) Detection Monitoring." However, according to ADEM Admin. Code r. 335-4-.27(3)(c)2., if the owner or operator determines that there is an SSI over background, an assessment monitoring program must be established. The GWMP should be revised to indicate that assessment monitoring will be conducted in the event of a confirmed SSI above background values.

  Permittee's Response: TTL concurs with the Department's determination and will revise the GWMP to indicate that Assessment Monitoring will be initiated (or continued) in the event that a constituent is detected at a level determined to represent an SSI above background levels that cannot be attributed to errors in sampling, laboratory analysis, statistical evaluation, or natural variation in groundwater quality.

Groundwater Monitoring & Statistical Analysis Report, September 2021

- **ADEM Comment No. 5:** The GWMR includes non-parametric confidence intervals constructed around the median for cobalt detected in compliance wells MW-6, MW-7, and MW-8 and for 1,1-dichloroethane and 1,2-dichloroethene-(cis) detected in monitoring well MW-8. Concentrations of 1,1-dichloroethane were non-detect prior to March 2011, and concentrations of 1,2-dichloroethene-(cis) were non-detect prior to April 2013, and fairly consistent detection of these two constituents appear to show a shift in concentration since these dates. According to Section 7.4.4 of the Unified Guidance, confidence limits constructed on changing data may be overly wide and not be reflective of a shift in contaminant distribution; therefore, it is recommended that future confidence limits for 1,1-dichloroethane and 1,2-dichloroethene-(cis) be computed using the most recent stable measurements.

  The SSI indicated for cobalt are likely the results of inadequate background data collected at low reporting limits and the simple substitution of non-detect data with zero. Concentrations of cobalt in monitoring wells MW-6, MW-7, and MW-8 were non-detect prior to September 2020, and historical results indicate that the reporting limit for cobalt was set at 50 µg/L. Section 15.1 of the Unified Guidance indicates that non-detect values higher than other quantified data should be removed. Therefore, it is recommended that all cobalt data collected at the site prior to September 2020 be removed and that 8 to 10 independent background observations be collected at the lower reporting limit prior to conducting statistical analysis of cobalt. It may be appropriate to analyze background samples for cobalt quarterly until an adequate background dataset is established.

  Permittee's Response: According to Section 7.4.4 of the Unified Guidance, while accumulating compliance point data over time and successively re-computing confidence limits is appropriate for stable populations, it can give misleading or false results when the underlying population is changing. The reporting limit of 5 µg/L was utilized for 1,1-Dichlororethane and 1,2-dichloroethene-(cis) in compliance well MW-8 from the first monitoring event conducted on July 30, 1996 until September 16, 2009. The reporting limit of 5 µg/L for both 1,1-Dichlororethane and 1,2-dichloroethene-(cis) was later reduced to of 1 µg/L beginning with the March 2010 groundwater monitoring event. Detectable concentrations of 1,1-Dichlororethane were first reported in compliance well MW-8 during the March 2011 and detectable concentrations of 1,2-dichloroethene-(cis) were first reported in compliance well MW-8 in April 2013. Since that time

relatively consistent concentrations of 1,1-Dichlororethane and 1,2-dichloroethene-(cis) have been reported as being present in compliance well MW-8.

If a discrete shift in concentration level is evident, a confidence limit should be computed on the most recent stable measurements. More recent measurements appear to exhibit less variation around the shifted mean value, thus resulting in a shorter confidence interval. Time series graphs for the concentrations of 1,1-Dichloroethane and 1,2-dichloroethene-(cis) detected in compliance well MW-8 beginning with the March 2011 event and the April 2013 event, respectively, have been included for reference. TTL concurs with the Department's recommendation and will ensure that all future confidence limits for 1,1-dichloroethane and 1,2-dichloroethene-(cis) will be computed using the most recent stable measurements.

According to Chapter 15 of the Unified Guidance, the simplest approach to managing non-detects is to substitute an imputed value for each non-detect concentration prior to statistical analysis. The imputation is intended to be a reasonable estimate of the true, but unknown concentration (e.g. 0 or ½) of the reporting limit. However, the non-detect values for compliance wells MW-6, MW-7 and MW-8 that have been historically reported as being higher than other quantified data at reasonable detection limits and is, therefore, not considered to be an appropriate comparison nor is it representative of present or near-term future conditions. TTL concurs with the Department's determination and will remove the older, less reliable data prior to the statistical analysis of detected cobalt concentrations in compliance wells MW-6, MW-7, and MW-8. Based on TTL's review of the historical concentration reports, the practicable quantitation limit of 2 µg/L for cobalt has been utilized since the September 2020 groundwater monitoring event (four independent events in total). A multi-well time-series graph for cobalt is attached for reference. Four observations from a population are generally considered to be insufficient for statistical analysis. The Unified Guidance recommends that a minimum of at least 8 to 10 independent background observations to be collected before running most statistical tests. TTL concurs with the Department's recommendation and will sample upgradient wells MW-1 and MW-2 and compliance wells MW-6, MW-7, and MW-8 for the analysis of cobalt on a quarterly basis until an adequate background dataset is established.

Upon your review of this response letter, please feel free to contact either Mr. Mark Tanner or Mrs. Annelyse Helms with any questions or concerns.

Sincerely,

TTL, Inc.

Annelyse W. Helms, P.G.
Project Professional

J. Mark Tanner, P.G.
Sr. Principal Geologist
Alabama License No.249

J. MARK TANNER
ALABAMA LICENSED PROFESSIONAL GEOLOGIST
LIC. 247

cc: *Heather Jones, ADEM (HJones@adem.alabama.gov)*
Ken Thrasher, Black Warrior Solid Waste Authority (kent@bwswa.com)
Daniel Wells, CDG Engineers & Associates (Daniel.Wells@cdge.com)

Attachments:
1. ADEM Letter, dated February 14, 2022
2. Concentrations Reports (1,1-dichloroethane and 1,2-dichloroethene-(cis), and cobalt)
3. Historical Trend Analysis

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov
1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

February 14, 2022

CERTIFIED MAIL 9489 0090 0027 6203 5763 48
RETURN RECEIPT REQUESTED

Mr. Ken Thrasher
Black Warrior Solid Waste Disposal Authority
3301 Landfill Drive
Coker, AL 35452

RE: Hydrogeology Review
Black Warrior Solid Waste Disposal Facility
Permit 63-01

Dear Mr. Thrasher:

The Department has conducted a hydrogeology review for the referenced facility. After review of the Revised Groundwater Monitoring Plan (GWMP) and the March 2021 Groundwater Monitoring and Statistical Analysis Report (GWMR), the following comments were made:

1. Section 1.1.17 of the GWMP cites ADEM Code r. 335-13-4-.27(16)(c); however, it appears that the appropriate rule is 335-13-4-.27(2)(l) which requires the owner or operator to specify in writing one of the statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent. Clarification or revision is recommended.

2. Section 1.1.17 of the GWMP specifies that a tolerance or prediction interval procedure will be used to evaluate groundwater monitoring data. The GWMP should specify that the facility is currently using interwell statistical methods in which downgradient compliance concentrations in a given well are compared to upgradient background concentrations.

3. Trend testing is recommended in Chapter 17 of the Unified Guidance to identify those groundwater populations whose mean concentrations are not stationary over time. The GWMP should indicate that trend testing will be included in groundwater monitoring reports.

4. Section 1.1.19 of the GWMP states "If a groundwater constituent is detected at a level determined to represent an SSI (statistically significant increase) above background values and the SSI cannot be attributed to errors in sampling, laboratory analysis, statistical evaluation, or natural variation in groundwater quality, the facility is typically required to initiate (or continue) Detection Monitoring." However, according to ADEM Admin. Code r. 335-13-4-.27(3)(c)2., if the owner or operator determines that there is an SSI over background, an assessment monitoring program must be established. The GWMP should be revised to indicate that assessment monitoring will be conducted in the event of a confirmed SSI above background values.

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Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
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(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

1,2-dichloroethene-(cis) detected in monitoring well MW-8. Concentrations of 1,1-dichloroethane were non-detect prior to March 2011, and concentrations of 1,2-dichloroethene-(cis) were non-detect prior to April 2013, and fairly consistent detections of these two constituents appear to show a shift in concentration since these dates. According to Section 7.4.4 of the Unified Guidance, confidence limits constructed on changing data may be overly wide and not be reflective of a shift in contaminant distribution; therefore, it is recommended that future confidence limits for 1,1-dichloroethane and 1,2-dichloroethene-(cis) be computed using the most recent stable measurements.

The SSIs indicated for cobalt are likely the result of inadequate background data collected at low reporting limits and the simple substitution of non-detect data with zero. Concentrations of cobalt in monitoring wells MW-6, MW-7, and MW-8 were non-detect prior to September 2020, and historical results indicate that the reporting limit for cobalt was set at 50 µg /L. Section 15.1 of the Unified Guidance indicates that non-detect values higher than other quantified data should be removed. Therefore, it is recommended that all cobalt data collected at the site prior to September 2020 be removed and that 8 to 10 independent background observations be collected at the lower reporting limit prior to conducting statistical analysis for cobalt. It may be appropriate to analyze background samples for cobalt quarterly until an adequate background dataset is established.

In order for the Department to consider the permit renewal, please provide the suggested information within 30 days of receipt of this letter.

If you have any questions regarding this matter, please contact Hunter Baker of the Solid Waste Engineering Section at (334) 270-5607.

Sincerely,

Jared Kelly, Chief
Solid Waste Engineering Section
Land Division

JDK/hb

Concentrations (ppb)

Parameter: 1,1-Dichloroethane

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 505
Total Non-Detect: 483
Percent Non-Detects: 95.6436%
Total Background Measurements: 123
There are 3 background locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	56	56 (100%)	7/29/1996	ND<5	ND<5
			8/20/1996	ND<5	ND<5
			9/9/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/20/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/19/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/22/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/6/2006	ND<5	ND<5
			3/6/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/19/2009	ND<5	ND<5
			9/15/2009	ND<5	ND<5
			3/2/2010	ND<1	ND<1
			9/10/2010	ND<1	ND<1
			3/9/2011	ND<1	ND<1
			9/13/2011	ND<1	ND<1
			3/20/2012	ND<1	ND<1
			9/11/2012	ND<1	ND<1
			3/15/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/18/2014	ND<1	ND<1
			9/9/2014	ND<1	ND<1
			3/24/2015	ND<1	ND<1
			9/24/2015	ND<1	ND<1
			3/29/2016	ND<1	ND<1
			9/27/2016	ND<1	ND<1

			3/23/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/15/2018	ND<1	ND<1
			9/20/2018	ND<1	ND<1
			3/12/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/18/2020	ND<1	ND<1
			9/10/2020	ND<1	ND<1
			3/24/2021	ND<1	ND<1
			9/16/2021	ND<1	ND<1
			3/4/2022	ND<1	ND<1
MW-2	56	56 (100%)	7/29/1996	ND<5	ND<5
			8/19/1996	ND<5	ND<5
			9/9/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/19/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/19/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/22/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/6/2006	ND<5	ND<5
			3/6/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/19/2009	ND<5	ND<5
			9/15/2009	ND<5	ND<5
			3/2/2010	ND<1	ND<1
			9/8/2010	ND<1	ND<1
			3/11/2011	ND<1	ND<1
			9/13/2011	ND<1	ND<1
			3/20/2012	ND<1	ND<1
			9/11/2012	ND<1	ND<1
			3/15/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/18/2014	ND<1	ND<1
			9/9/2014	ND<1	ND<1
			3/24/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/29/2016	ND<1	ND<1
			9/28/2016	ND<1	ND<1

			3/22/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/15/2018	ND<1	ND<1
			9/20/2018	ND<1	ND<1
			3/12/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/18/2020	ND<1	ND<1
			9/11/2020	ND<1	ND<1
			3/26/2021	ND<1	ND<1
			9/16/2021	ND<1	ND<1
			3/4/2022	ND<1	ND<1
MW-3u	11	11 (100%)	7/30/1996	ND<5	ND<5
			8/20/1996	ND<5	ND<5
			9/10/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/9/1999	ND<5	ND<5

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3d	38	38 (100%)	3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/22/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/6/2006	ND<5	ND<5
			3/6/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/10/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/2/2010	ND<1	ND<1
			9/8/2010	ND<1	ND<1
			3/10/2011	ND<1	ND<1
			9/14/2011	ND<1	ND<1
			3/21/2012	ND<1	ND<1
			9/12/2012	ND<1	ND<1
			3/14/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/19/2014	ND<1	ND<1

			9/10/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/24/2016	ND<1	ND<1
			9/30/2016	ND<1	ND<1
			3/23/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/15/2018	ND<1	ND<1
			9/20/2018	ND<1	ND<1
MW-5	55	55 (100%)	11/20/1996	ND<5	ND<5
			11/27/1996	ND<5	ND<5
			12/4/1996	ND<5	ND<5
			12/11/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/9/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/12/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/23/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/9/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/8/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/3/2010	ND<1	ND<1
			9/10/2010	ND<1	ND<1
			3/9/2011	ND<1	ND<1
			9/15/2011	ND<1	ND<1
			3/21/2012	ND<1	ND<1
			9/12/2012	ND<1	ND<1
			3/13/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/19/2014	ND<1	ND<1
			9/11/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/29/2016	ND<1	ND<1
			9/28/2016	ND<1	ND<1
			3/21/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/13/2018	ND<1	ND<1

			9/18/2018	ND<1	ND<1
			3/12/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/17/2020	ND<1	ND<1
			9/9/2020	ND<1	ND<1
			3/25/2021	ND<1	ND<1
			9/15/2021	ND<1	ND<1
			3/2/2022	ND<1	ND<1
MW-6	55	55 (100%)	11/20/1996	ND<5	ND<5
			11/27/1996	ND<5	ND<5
			12/4/1996	ND<5	ND<5
			12/11/1996	ND<5	ND<5
			3/5/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/13/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/23/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/9/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/8/2007	ND<5	ND<5
			9/19/2007	ND<5	ND<5
			3/12/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/17/2009	ND<5	ND<5
			3/3/2010	ND<1	ND<1
			9/10/2010	ND<1	ND<1
			3/10/2011	ND<1	ND<1
			9/15/2011	ND<1	ND<1
			3/22/2012	ND<1	ND<1
			9/13/2012	ND<1	ND<1
			3/13/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/20/2014	ND<1	ND<1
			9/11/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/24/2015	ND<1	ND<1
			3/28/2016	ND<1	ND<1
			9/28/2016	ND<1	ND<1
			3/21/2017	ND<1	ND<1
			9/19/2017	ND<1	ND<1
			3/13/2018	ND<1	ND<1
			9/18/2018	ND<1	ND<1

			3/14/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/17/2020	ND<1	ND<1
			9/9/2020	ND<1	ND<1
			3/23/2021	ND<1	ND<1
			9/15/2021	ND<1	ND<1
			3/2/2022	ND<1	ND<1
MW-7	55	55 (100%)	11/20/1996	ND<5	ND<5
			11/27/1996	ND<5	ND<5
			12/4/1996	ND<5	ND<5
			12/11/1996	ND<5	ND<5
			3/5/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/16/2000	ND<5	ND<5
			9/14/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/13/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/24/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/9/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/7/2007	ND<5	ND<5
			9/19/2007	ND<5	ND<5
			3/12/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/17/2009	ND<5	ND<5
			3/3/2010	ND<1	ND<1
			9/10/2010	ND<1	ND<1
			3/11/2011	ND<1	ND<1
			9/15/2011	ND<1	ND<1
			3/22/2012	ND<1	ND<1
			9/13/2012	ND<1	ND<1
			3/13/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/20/2014	ND<1	ND<1
			9/11/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/28/2016	ND<1	ND<1
			9/29/2016	ND<1	ND<1
			3/21/2017	ND<1	ND<1
			9/19/2017	ND<1	ND<1
			3/14/2018	ND<1	ND<1
			9/18/2018	ND<1	ND<1
			3/14/2019	ND<1	ND<1

			9/19/2019	ND<1	ND<1
			3/16/2020	ND<1	ND<1
			9/10/2020	ND<1	ND<1
			3/23/2021	ND<1	ND<1
			9/15/2021	ND<1	ND<1
			3/2/2022	ND<1	ND<1
MW-4	55	55 (100%)	7/30/1996	ND<5	ND<5
			8/20/1996	ND<5	ND<5
			9/10/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/9/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/12/2002	ND<5	ND<5
			9/19/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/23/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/9/2006	ND<5	ND<5
			9/6/2006	ND<5	ND<5
			3/6/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/10/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/2/2010	ND<1	ND<1
			9/9/2010	ND<1	ND<1
			3/10/2011	ND<1	ND<1
			9/14/2011	ND<1	ND<1
			3/21/2012	ND<1	ND<1
			9/12/2012	ND<1	ND<1
			3/14/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/19/2014	ND<1	ND<1
			9/10/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/24/2015	ND<1	ND<1
			3/29/2016	ND<1	ND<1
			9/29/2016	ND<1	ND<1
			3/22/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/15/2018	ND<1	ND<1
			9/19/2018	ND<1	ND<1
			3/14/2019	ND<1	ND<1

			9/19/2019	ND<1	ND<1
			3/17/2020	ND<1	ND<1
			9/11/2020	ND<1	ND<1
			3/24/2021	ND<1	ND<1
			9/17/2021	ND<1	ND<1
MW-8	62	40 (64.5161%)	7/30/1996	ND<5	ND<5
			8/20/1996	ND<5	ND<5
			9/9/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/5/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/19/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/9/1999	ND<5	ND<5
			3/16/2000	ND<5	ND<5
			9/14/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/22/2004	ND<5	ND<5
			3/24/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/7/2007	ND<5	ND<5
			9/19/2007	ND<5	ND<5
			3/12/2008	ND<5	ND<5
			9/10/2008	ND<5	ND<5
			3/19/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/4/2010	ND<1	ND<1
			9/9/2010	ND<1	ND<1
			3/11/2011	1.05	1.05
			9/14/2011	1.09	1.09
			3/22/2012	1.42	1.42
			9/13/2012	1.27	1.27
			3/13/2013	1.05	1.05
			4/29/2013	2.4	2.4
			6/12/2013	2.12	2.12
			9/18/2013	ND<1	ND<1
			12/10/2013	2.13	2.13
			3/20/2014	1.42	1.42
			9/10/2014	1.24	1.24
			3/26/2015	1.45	1.45
			9/23/2015	ND<1	ND<1
			3/24/2016	ND<1	ND<1
			9/29/2016	2.42	2.42
			11/17/2016	2.33	2.33
			3/20/2017	2.54	2.54
			9/19/2017	2.81	2.81

			11/20/2017	2.45	2.45
			3/14/2018	1.97	1.97
			9/19/2018	2.64	2.64
			3/13/2019	2.45	2.45
			5/17/2019	ND<1.6	ND<1.6
			9/19/2019	2.18	2.18
			3/18/2020	ND<1	ND<1
			9/10/2020	1.53	1.53
			3/24/2021	1.31	1.31
			9/17/2021	ND<1	ND<1
			3/3/2022	ND<1	ND<1
MW-9	55	55 (100%)	7/29/1996	ND<5	ND<5
			8/19/1996	ND<5	ND<5
			9/9/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/5/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/20/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/16/2000	ND<5	ND<5
			9/14/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/22/2004	ND<5	ND<5
			3/24/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/7/2007	ND<5	ND<5
			9/19/2007	ND<5	ND<5
			3/12/2008	ND<5	ND<5
			9/10/2008	ND<5	ND<5
			3/19/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/4/2010	ND<1	ND<1
			9/9/2010	ND<1	ND<1
			3/11/2011	ND<1	ND<1
			9/14/2011	ND<1	ND<1
			3/22/2012	ND<1	ND<1
			9/13/2012	ND<1	ND<1
			3/14/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/20/2014	ND<1	ND<1
			9/10/2014	ND<1	ND<1
			3/26/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/24/2016	ND<1	ND<1
			9/29/2016	ND<1	ND<1

			3/20/2017	ND<1	ND<1
			9/19/2017	ND<1	ND<1
			3/14/2018	ND<1	ND<1
			9/19/2018	ND<1	ND<1
			3/13/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/18/2020	ND<1	ND<1
			9/10/2020	ND<1	ND<1
			3/24/2021	ND<1	ND<1
			9/17/2021	ND<1	ND<1
MW-3R	7	7 (100%)	3/13/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/16/2020	ND<1	ND<1
			9/11/2020	ND<1	ND<1
			3/26/2021	ND<1	ND<1
			9/16/2021	ND<1	ND<1
			3/4/2022	ND<1	ND<1

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Concentrations (ppb)

Parameter: cis-1,2-Dichloroethene

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 506
Total Non-Detect: 490
Percent Non-Detects: 96.8379%
Total Background Measurements: 123
There are 3 background locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	56	56 (100%)	7/29/1996	ND<5	ND<5
			8/20/1996	ND<5	ND<5
			9/9/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/20/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/19/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/22/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/6/2006	ND<5	ND<5
			3/6/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/19/2009	ND<5	ND<5
			9/15/2009	ND<5	ND<5
			3/2/2010	ND<1	ND<1
			9/10/2010	ND<1	ND<1
			3/9/2011	ND<1	ND<1
			9/13/2011	ND<1	ND<1
			3/20/2012	ND<1	ND<1
			9/11/2012	ND<1	ND<1
			3/15/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/18/2014	ND<1	ND<1
			9/9/2014	ND<1	ND<1
			3/24/2015	ND<1	ND<1
			9/24/2015	ND<1	ND<1
			3/29/2016	ND<1	ND<1
			9/27/2016	ND<1	ND<1

			3/23/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/15/2018	ND<1	ND<1
			9/20/2018	ND<1	ND<1
			3/12/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/18/2020	ND<1	ND<1
			9/10/2020	ND<1	ND<1
			3/24/2021	ND<1	ND<1
			9/16/2021	ND<1	ND<1
			3/4/2022	ND<1	ND<1
MW-2	56	56 (100%)	7/29/1996	ND<5	ND<5
			8/19/1996	ND<5	ND<5
			9/9/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/19/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/19/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/22/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/6/2006	ND<5	ND<5
			3/6/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/19/2009	ND<5	ND<5
			9/15/2009	ND<5	ND<5
			3/2/2010	ND<1	ND<1
			9/8/2010	ND<1	ND<1
			3/11/2011	ND<1	ND<1
			9/13/2011	ND<1	ND<1
			3/20/2012	ND<1	ND<1
			9/11/2012	ND<1	ND<1
			3/15/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/18/2014	ND<1	ND<1
			9/9/2014	ND<1	ND<1
			3/24/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/29/2016	ND<1	ND<1
			9/28/2016	ND<1	ND<1

			3/22/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/15/2018	ND<1	ND<1
			9/20/2018	ND<1	ND<1
			3/12/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/18/2020	ND<1	ND<1
			9/11/2020	ND<1	ND<1
			3/26/2021	ND<1	ND<1
			9/16/2021	ND<1	ND<1
			3/4/2022	ND<1	ND<1
MW-3u	11	11 (100%)	7/30/1996	ND<5	ND<5
			8/20/1996	ND<5	ND<5
			9/10/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/9/1999	ND<5	ND<5

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3d	38	38 (100%)	3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/22/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/6/2006	ND<5	ND<5
			3/6/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/10/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/2/2010	ND<1	ND<1
			9/8/2010	ND<1	ND<1
			3/10/2011	ND<1	ND<1
			9/14/2011	ND<1	ND<1
			3/21/2012	ND<1	ND<1
			9/12/2012	ND<1	ND<1
			3/14/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/19/2014	ND<1	ND<1

			9/10/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/24/2016	ND<1	ND<1
			9/30/2016	ND<1	ND<1
			3/23/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/15/2018	ND<1	ND<1
			9/20/2018	ND<1	ND<1
MW-6	55	55 (100%)	11/20/1996	ND<5	ND<5
			11/27/1996	ND<5	ND<5
			12/4/1996	ND<5	ND<5
			12/11/1996	ND<5	ND<5
			3/5/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/13/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/23/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/9/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/8/2007	ND<5	ND<5
			9/19/2007	ND<5	ND<5
			3/12/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/17/2009	ND<5	ND<5
			3/3/2010	ND<1	ND<1
			9/10/2010	ND<1	ND<1
			3/10/2011	ND<1	ND<1
			9/15/2011	ND<1	ND<1
			3/22/2012	ND<1	ND<1
			9/13/2012	ND<1	ND<1
			3/13/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/20/2014	ND<1	ND<1
			9/11/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/24/2015	ND<1	ND<1
			3/28/2016	ND<1	ND<1
			9/28/2016	ND<1	ND<1
			3/21/2017	ND<1	ND<1
			9/19/2017	ND<1	ND<1
			3/13/2018	ND<1	ND<1

			9/18/2018	ND<1	ND<1
			3/14/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/17/2020	ND<1	ND<1
			9/9/2020	ND<1	ND<1
			3/23/2021	ND<1	ND<1
			9/15/2021	ND<1	ND<1
			3/2/2022	ND<1	ND<1
MW-4	55	55 (100%)	7/30/1996	ND<5	ND<5
			8/20/1996	ND<5	ND<5
			9/10/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/9/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/12/2002	ND<5	ND<5
			9/19/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/23/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/9/2006	ND<5	ND<5
			9/6/2006	ND<5	ND<5
			3/6/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/10/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/2/2010	ND<1	ND<1
			9/9/2010	ND<1	ND<1
			3/10/2011	ND<1	ND<1
			9/14/2011	ND<1	ND<1
			3/21/2012	ND<1	ND<1
			9/12/2012	ND<1	ND<1
			3/14/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/19/2014	ND<1	ND<1
			9/10/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/24/2015	ND<1	ND<1
			3/29/2016	ND<1	ND<1
			9/29/2016	ND<1	ND<1
			3/22/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/15/2018	ND<1	ND<1

			9/19/2018	ND<1	ND<1
			3/14/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/17/2020	ND<1	ND<1
			9/11/2020	ND<1	ND<1
			3/24/2021	ND<1	ND<1
			9/17/2021	ND<1	ND<1
MW-8	63	47 (74.6032%)	7/30/1996	ND<5	ND<5
			8/20/1996	ND<5	ND<5
			9/9/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/5/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/19/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/9/1999	ND<5	ND<5
			3/16/2000	ND<5	ND<5
			9/14/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/22/2004	ND<5	ND<5
			3/24/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/7/2007	ND<5	ND<5
			9/19/2007	ND<5	ND<5
			3/12/2008	ND<5	ND<5
			9/10/2008	ND<5	ND<5
			3/19/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/4/2010	ND<1	ND<1
			9/9/2010	ND<1	ND<1
			3/11/2011	ND<1	ND<1
			9/14/2011	ND<1	ND<1
			3/22/2012	ND<1	ND<1
			9/13/2012	ND<1	ND<1
			3/13/2013	ND<1	ND<1
			4/29/2013	1.2	1.2
			6/12/2013	1.16	1.16
			9/18/2013	ND<1	ND<1
			12/10/2013	ND<1	ND<1
			3/20/2014	ND<1	ND<1
			9/10/2014	ND<1	ND<1
			3/26/2015	1.03	1.03
			5/27/2015	1.3	1.3
			9/23/2015	ND<1	ND<1
			3/24/2016	ND<1	ND<1
			9/29/2016	1.75	1.75

			11/17/2016	1.96	1.96
			3/20/2017	1.76	1.76
			9/19/2017	2.22	2.22
			3/14/2018	1.59	1.59
			9/19/2018	2.02	2.02
			10/30/2018	2.37	2.37
			3/13/2019	2.27	2.27
			5/17/2019	ND<1.5	ND<1.5
			9/19/2019	2.27	2.27
			3/18/2020	ND<1	ND<1
			9/10/2020	1.44	1.44
			3/24/2021	1.3	1.3
			9/17/2021	1.43	1.43
			3/3/2022	ND<1	ND<1
MW-9	55	55 (100%)	7/29/1996	ND<5	ND<5
			8/19/1996	ND<5	ND<5
			9/9/1996	ND<5	ND<5
			9/26/1996	ND<5	ND<5
			11/21/1996	ND<5	ND<5
			3/5/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/20/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/16/2000	ND<5	ND<5
			9/14/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/11/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/22/2004	ND<5	ND<5
			3/24/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/8/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/7/2007	ND<5	ND<5
			9/19/2007	ND<5	ND<5
			3/12/2008	ND<5	ND<5
			9/10/2008	ND<5	ND<5
			3/19/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/4/2010	ND<1	ND<1
			9/9/2010	ND<1	ND<1
			3/11/2011	ND<1	ND<1
			9/14/2011	ND<1	ND<1
			3/22/2012	ND<1	ND<1
			9/13/2012	ND<1	ND<1
			3/14/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/20/2014	ND<1	ND<1
			9/10/2014	ND<1	ND<1
			3/26/2015	ND<1	ND<1

			9/23/2015	ND<1	ND<1
			3/24/2016	ND<1	ND<1
			9/29/2016	ND<1	ND<1
			3/20/2017	ND<1	ND<1
			9/19/2017	ND<1	ND<1
			3/14/2018	ND<1	ND<1
			9/19/2018	ND<1	ND<1
			3/13/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/18/2020	ND<1	ND<1
			9/10/2020	ND<1	ND<1
			3/24/2021	ND<1	ND<1
			9/17/2021	ND<1	ND<1
MW-5	55	55 (100%)	11/20/1996	ND<5	ND<5
			11/27/1996	ND<5	ND<5
			12/4/1996	ND<5	ND<5
			12/11/1996	ND<5	ND<5
			3/4/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/9/1999	ND<5	ND<5
			3/15/2000	ND<5	ND<5
			9/13/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/12/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/23/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/9/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/8/2007	ND<5	ND<5
			9/18/2007	ND<5	ND<5
			3/11/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/16/2009	ND<5	ND<5
			3/3/2010	ND<1	ND<1
			9/10/2010	ND<1	ND<1
			3/9/2011	ND<1	ND<1
			9/15/2011	ND<1	ND<1
			3/21/2012	ND<1	ND<1
			9/12/2012	ND<1	ND<1
			3/13/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/19/2014	ND<1	ND<1
			9/11/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/29/2016	ND<1	ND<1

			9/28/2016	ND<1	ND<1
			3/21/2017	ND<1	ND<1
			9/20/2017	ND<1	ND<1
			3/13/2018	ND<1	ND<1
			9/18/2018	ND<1	ND<1
			3/12/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/17/2020	ND<1	ND<1
			9/9/2020	ND<1	ND<1
			3/25/2021	ND<1	ND<1
			9/15/2021	ND<1	ND<1
			3/2/2022	ND<1	ND<1
MW-7	55	55 (100%)	11/20/1996	ND<5	ND<5
			11/27/1996	ND<5	ND<5
			12/4/1996	ND<5	ND<5
			12/11/1996	ND<5	ND<5
			3/5/1997	ND<5	ND<5
			9/11/1997	ND<5	ND<5
			3/24/1998	ND<5	ND<5
			9/18/1998	ND<5	ND<5
			3/10/1999	ND<5	ND<5
			9/8/1999	ND<5	ND<5
			3/16/2000	ND<5	ND<5
			9/14/2000	ND<5	ND<5
			3/23/2001	ND<5	ND<5
			9/13/2001	ND<5	ND<5
			3/13/2002	ND<5	ND<5
			9/18/2002	ND<5	ND<5
			3/20/2003	ND<5	ND<5
			9/17/2003	ND<5	ND<5
			3/10/2004	ND<5	ND<5
			9/21/2004	ND<5	ND<5
			3/24/2005	ND<5	ND<5
			9/15/2005	ND<5	ND<5
			3/9/2006	ND<5	ND<5
			9/7/2006	ND<5	ND<5
			3/7/2007	ND<5	ND<5
			9/19/2007	ND<5	ND<5
			3/12/2008	ND<5	ND<5
			9/9/2008	ND<5	ND<5
			3/18/2009	ND<5	ND<5
			9/17/2009	ND<5	ND<5
			3/3/2010	ND<1	ND<1
			9/10/2010	ND<1	ND<1
			3/11/2011	ND<1	ND<1
			9/15/2011	ND<1	ND<1
			3/22/2012	ND<1	ND<1
			9/13/2012	ND<1	ND<1
			3/13/2013	ND<1	ND<1
			9/19/2013	ND<1	ND<1
			3/20/2014	ND<1	ND<1
			9/11/2014	ND<1	ND<1
			3/25/2015	ND<1	ND<1
			9/23/2015	ND<1	ND<1
			3/28/2016	ND<1	ND<1
			9/29/2016	ND<1	ND<1

			3/21/2017	ND<1	ND<1
			9/19/2017	ND<1	ND<1
			3/14/2018	ND<1	ND<1
			9/18/2018	ND<1	ND<1
			3/14/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/16/2020	ND<1	ND<1
			9/10/2020	ND<1	ND<1
			3/23/2021	ND<1	ND<1
			9/15/2021	ND<1	ND<1
			3/2/2022	ND<1	ND<1
MW-3R	7	7 (100%)	3/13/2019	ND<1	ND<1
			9/19/2019	ND<1	ND<1
			3/16/2020	ND<1	ND<1
			9/11/2020	ND<1	ND<1
			3/26/2021	ND<1	ND<1
			9/16/2021	ND<1	ND<1
			3/4/2022	ND<1	ND<1

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Concentrations (ppb)

Parameter: Cobalt

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 500
Total Non-Detect: 484
Percent Non-Detects: 96.8%
Total Background Measurements: 123
There are 3 background locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	56	56 (100%)	7/29/1996	ND<50	ND<50
			8/20/1996	ND<50	ND<50
			9/9/1996	ND<50	ND<50
			9/26/1996	ND<50	ND<50
			11/21/1996	ND<50	ND<50
			3/4/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/20/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/8/1999	ND<50	ND<50
			3/15/2000	ND<50	ND<50
			9/13/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/11/2002	ND<50	ND<50
			9/19/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/21/2004	ND<50	ND<50
			3/22/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/8/2006	ND<50	ND<50
			9/6/2006	ND<50	ND<50
			3/6/2007	ND<50	ND<50
			9/18/2007	ND<50	ND<50
			3/11/2008	ND<50	ND<50
			9/9/2008	ND<50	ND<50
			3/19/2009	ND<50	ND<50
			9/15/2009	ND<50	ND<50
			3/2/2010	ND<50	ND<50
			9/10/2010	ND<50	ND<50
			3/9/2011	ND<50	ND<50
			9/13/2011	ND<50	ND<50
			3/20/2012	ND<50	ND<50
			9/11/2012	ND<50	ND<50
			3/15/2013	ND<50	ND<50
			9/19/2013	ND<50	ND<50
			3/18/2014	ND<50	ND<50
			9/9/2014	ND<50	ND<50
			3/24/2015	ND<50	ND<50
			9/24/2015	ND<50	ND<50
			3/29/2016	ND<50	ND<50
			9/26/2016	ND<50	ND<50

			3/24/2017	ND<50	ND<50
			9/21/2017	ND<50	ND<50
			3/16/2018	ND<50	ND<50
			9/21/2018	ND<50	ND<50
			3/13/2019	ND<50	ND<50
			9/20/2019	ND<50	ND<50
			3/19/2020	ND<50	ND<50
			9/11/2020	ND<2	ND<2
			3/24/2021	ND<2	ND<2
			9/17/2021	ND<2	ND<2
			3/5/2022	ND<2	ND<2
MW-2	56	54 (96.4286%)	7/29/1996	ND<50	ND<50
			8/19/1996	ND<50	ND<50
			9/9/1996	ND<50	ND<50
			9/26/1996	ND<50	ND<50
			11/21/1996	ND<50	ND<50
			3/4/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/19/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/8/1999	ND<50	ND<50
			3/15/2000	ND<50	ND<50
			9/13/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/11/2002	ND<50	ND<50
			9/19/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/21/2004	ND<50	ND<50
			3/22/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/8/2006	ND<50	ND<50
			9/6/2006	ND<50	ND<50
			3/6/2007	ND<50	ND<50
			9/18/2007	ND<50	ND<50
			3/11/2008	ND<50	ND<50
			9/9/2008	ND<50	ND<50
			3/19/2009	ND<50	ND<50
			9/15/2009	ND<50	ND<50
			3/2/2010	ND<50	ND<50
			9/8/2010	ND<50	ND<50
			3/11/2011	ND<50	ND<50
			9/13/2011	ND<50	ND<50
			3/20/2012	ND<50	ND<50
			9/11/2012	ND<50	ND<50
			3/15/2013	ND<50	ND<50
			9/19/2013	ND<50	ND<50
			3/18/2014	ND<50	ND<50
			9/9/2014	ND<50	ND<50
			3/24/2015	ND<50	ND<50
			9/23/2015	ND<50	ND<50
			3/29/2016	ND<50	ND<50
			9/27/2016	ND<50	ND<50

			3/23/2017	ND<50	ND<50
			9/21/2017	ND<50	ND<50
			3/16/2018	ND<50	ND<50
			9/21/2018	ND<50	ND<50
			3/13/2019	ND<50	ND<50
			9/20/2019	ND<50	ND<50
			3/19/2020	ND<50	ND<50
			9/12/2020	ND<2	ND<2
			3/26/2021	ND<2	ND<2
			9/17/2021	2.18	2.18
			3/5/2022	2.94	2.94
MW-3u	11	11 (100%)	7/30/1996	ND<50	ND<50
			8/20/1996	ND<50	ND<50
			9/10/1996	ND<50	ND<50
			9/26/1996	ND<50	ND<50
			11/21/1996	ND<50	ND<50
			3/4/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/24/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/9/1999	ND<50	ND<50

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-4	55	54 (98.1818%)	7/30/1996	ND<50	ND<50
			8/20/1996	ND<50	ND<50
			9/10/1996	ND<50	ND<50
			9/26/1996	ND<50	ND<50
			11/21/1996	ND<50	ND<50
			3/4/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/24/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/9/1999	ND<50	ND<50
			3/15/2000	ND<50	ND<50
			9/13/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/12/2002	ND<50	ND<50
			9/19/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/21/2004	ND<50	ND<50
			3/23/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/9/2006	ND<50	ND<50
			9/6/2006	ND<50	ND<50
			3/6/2007	ND<50	ND<50
			9/18/2007	ND<50	ND<50
			3/11/2008	ND<50	ND<50
			9/10/2008	ND<50	ND<50

			3/18/2009	ND<50	ND<50
			9/16/2009	ND<50	ND<50
			3/2/2010	ND<50	ND<50
			9/9/2010	ND<50	ND<50
			3/10/2011	ND<50	ND<50
			9/14/2011	ND<50	ND<50
			3/21/2012	ND<50	ND<50
			9/12/2012	ND<50	ND<50
			3/14/2013	ND<50	ND<50
			9/19/2013	ND<50	ND<50
			3/19/2014	ND<50	ND<50
			9/10/2014	ND<50	ND<50
			3/25/2015	ND<50	ND<50
			9/24/2015	ND<50	ND<50
			3/29/2016	ND<50	ND<50
			9/28/2016	ND<50	ND<50
			3/23/2017	ND<50	ND<50
			9/21/2017	ND<50	ND<50
			3/16/2018	ND<50	ND<50
			9/20/2018	ND<50	ND<50
			3/15/2019	ND<50	ND<50
			9/19/2019	ND<50	ND<50
			3/18/2020	ND<50	ND<50
			9/12/2020	2.46	2.46
			3/24/2021	ND<2	ND<2
			9/18/2021	ND<2	ND<2
MW-5	56	54 (96.4286%)	11/20/1996	ND<50	ND<50
			11/27/1996	ND<50	ND<50
			12/4/1996	ND<50	ND<50
			12/11/1996	ND<50	ND<50
			3/4/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/24/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/9/1999	ND<50	ND<50
			3/15/2000	ND<50	ND<50
			9/13/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/12/2002	ND<50	ND<50
			9/18/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/21/2004	ND<50	ND<50
			3/23/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/9/2006	ND<50	ND<50
			9/7/2006	ND<50	ND<50
			3/8/2007	ND<50	ND<50
			9/18/2007	ND<50	ND<50
			3/11/2008	ND<50	ND<50
			9/9/2008	ND<50	ND<50
			3/18/2009	ND<50	ND<50
			9/16/2009	ND<50	ND<50

			3/3/2010	ND<50	ND<50
			9/10/2010	ND<50	ND<50
			3/9/2011	ND<50	ND<50
			9/15/2011	ND<50	ND<50
			3/21/2012	ND<50	ND<50
			6/26/2012	ND<50	ND<50
			9/12/2012	ND<50	ND<50
			3/13/2013	ND<50	ND<50
			9/19/2013	ND<50	ND<50
			3/19/2014	ND<50	ND<50
			9/11/2014	ND<50	ND<50
			3/25/2015	ND<50	ND<50
			9/23/2015	ND<50	ND<50
			3/29/2016	ND<50	ND<50
			9/27/2016	ND<50	ND<50
			3/22/2017	ND<50	ND<50
			9/21/2017	ND<50	ND<50
			3/14/2018	ND<50	ND<50
			9/19/2018	ND<50	ND<50
			3/13/2019	ND<50	ND<50
			9/18/2019	ND<50	ND<50
			3/18/2020	ND<50	ND<50
			9/10/2020	2	2
			3/25/2021	ND<2	ND<2
			9/16/2021	2.16	2.16
			3/3/2022	ND<2	ND<2
MW-9	55	55 (100%)	7/29/1996	ND<50	ND<50
			8/19/1996	ND<50	ND<50
			9/9/1996	ND<50	ND<50
			9/26/1996	ND<50	ND<50
			11/21/1996	ND<50	ND<50
			3/5/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/20/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/8/1999	ND<50	ND<50
			3/16/2000	ND<50	ND<50
			9/14/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/11/2002	ND<50	ND<50
			9/18/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/22/2004	ND<50	ND<50
			3/24/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/8/2006	ND<50	ND<50
			9/7/2006	ND<50	ND<50
			3/7/2007	ND<50	ND<50
			9/19/2007	ND<50	ND<50
			3/12/2008	ND<50	ND<50
			9/10/2008	ND<50	ND<50
			3/19/2009	ND<50	ND<50

			9/16/2009	ND<50	ND<50
			3/4/2010	ND<50	ND<50
			9/9/2010	ND<50	ND<50
			3/11/2011	ND<50	ND<50
			9/14/2011	ND<50	ND<50
			3/22/2012	ND<50	ND<50
			9/13/2012	ND<50	ND<50
			3/14/2013	ND<50	ND<50
			9/19/2013	ND<50	ND<50
			3/20/2014	ND<50	ND<50
			9/10/2014	ND<50	ND<50
			3/26/2015	ND<50	ND<50
			9/23/2015	ND<50	ND<50
			3/24/2016	ND<50	ND<50
			9/28/2016	ND<50	ND<50
			3/21/2017	ND<50	ND<50
			9/20/2017	ND<50	ND<50
			3/15/2018	ND<50	ND<50
			9/20/2018	ND<50	ND<50
			3/14/2019	ND<50	ND<50
			9/19/2019	ND<50	ND<50
			3/19/2020	ND<50	ND<50
			9/11/2020	ND<2	ND<2
			3/24/2021	ND<2	ND<2
			9/18/2021	ND<2	ND<2
MW-8	56	53 (94.6429%)	7/30/1996	ND<50	ND<50
			8/20/1996	ND<50	ND<50
			9/9/1996	ND<50	ND<50
			9/26/1996	ND<50	ND<50
			11/21/1996	ND<50	ND<50
			3/5/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/19/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/9/1999	ND<50	ND<50
			3/16/2000	ND<50	ND<50
			9/14/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/11/2002	ND<50	ND<50
			9/18/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/22/2004	ND<50	ND<50
			3/24/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/8/2006	ND<50	ND<50
			9/7/2006	ND<50	ND<50
			3/7/2007	ND<50	ND<50
			9/19/2007	ND<50	ND<50
			3/12/2008	ND<50	ND<50
			9/10/2008	ND<50	ND<50
			3/19/2009	ND<50	ND<50
			9/16/2009	ND<50	ND<50

			3/4/2010	ND<50	ND<50
			9/9/2010	ND<50	ND<50
			3/11/2011	ND<50	ND<50
			9/14/2011	ND<50	ND<50
			3/22/2012	ND<50	ND<50
			9/13/2012	ND<50	ND<50
			3/13/2013	ND<50	ND<50
			9/18/2013	ND<10	ND<10
			3/20/2014	ND<50	ND<50
			9/10/2014	ND<50	ND<50
			3/26/2015	ND<50	ND<50
			9/23/2015	ND<50	ND<50
			3/24/2016	ND<50	ND<50
			9/28/2016	ND<50	ND<50
			3/21/2017	ND<50	ND<50
			9/20/2017	ND<50	ND<50
			3/15/2018	ND<50	ND<50
			9/20/2018	ND<50	ND<50
			3/14/2019	ND<50	ND<50
			9/20/2019	ND<50	ND<50
			3/19/2020	ND<50	ND<50
			9/11/2020	3.25	3.25
			3/24/2021	2.66	2.66
			9/18/2021	2.27	2.27
			3/4/2022	ND<2	ND<2
MW-6	55	51 (92.7273%)	11/20/1996	ND<50	ND<50
			11/27/1996	ND<50	ND<50
			12/4/1996	ND<50	ND<50
			12/11/1996	ND<50	ND<50
			3/5/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/24/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/8/1999	ND<50	ND<50
			3/15/2000	ND<50	ND<50
			9/13/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/13/2002	ND<50	ND<50
			9/18/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/21/2004	ND<50	ND<50
			3/23/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/9/2006	ND<50	ND<50
			9/7/2006	ND<50	ND<50
			3/8/2007	ND<50	ND<50
			9/19/2007	ND<50	ND<50
			3/12/2008	ND<50	ND<50
			9/9/2008	ND<50	ND<50
			3/18/2009	ND<50	ND<50
			9/17/2009	ND<50	ND<50
			3/3/2010	ND<50	ND<50

			9/10/2010	ND<50	ND<50
			3/10/2011	ND<50	ND<50
			9/15/2011	ND<50	ND<50
			3/22/2012	ND<50	ND<50
			9/13/2012	ND<50	ND<50
			3/13/2013	ND<50	ND<50
			9/19/2013	ND<50	ND<50
			3/20/2014	ND<50	ND<50
			9/11/2014	ND<50	ND<50
			3/25/2015	ND<50	ND<50
			9/24/2015	ND<50	ND<50
			3/29/2016	ND<50	ND<50
			9/27/2016	ND<50	ND<50
			3/22/2017	ND<50	ND<50
			9/20/2017	ND<50	ND<50
			3/14/2018	ND<50	ND<50
			9/19/2018	ND<50	ND<50
			3/15/2019	ND<50	ND<50
			9/18/2019	ND<50	ND<50
			3/18/2020	ND<50	ND<50
			9/10/2020	3.34	3.34
			3/23/2021	2.06	2.06
			9/16/2021	4.97	4.97
			3/3/2022	4.77	4.77
MW-7	55	51 (92.7273%)	11/20/1996	ND<50	ND<50
			11/27/1996	ND<50	ND<50
			12/4/1996	ND<50	ND<50
			12/11/1996	ND<50	ND<50
			3/5/1997	ND<50	ND<50
			9/11/1997	ND<50	ND<50
			3/24/1998	ND<50	ND<50
			9/18/1998	ND<50	ND<50
			3/10/1999	ND<50	ND<50
			9/8/1999	ND<50	ND<50
			3/16/2000	ND<50	ND<50
			9/14/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/13/2002	ND<50	ND<50
			9/18/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/21/2004	ND<50	ND<50
			3/24/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/9/2006	ND<50	ND<50
			9/7/2006	ND<50	ND<50
			3/7/2007	ND<50	ND<50
			9/19/2007	ND<50	ND<50
			3/12/2008	ND<50	ND<50
			9/9/2008	ND<50	ND<50
			3/18/2009	ND<50	ND<50
			9/17/2009	ND<50	ND<50
			3/3/2010	ND<50	ND<50
			9/10/2010	ND<50	ND<50

			3/11/2011	ND<50	ND<50
			9/15/2011	ND<50	ND<50
			3/22/2012	ND<50	ND<50
			9/13/2012	ND<50	ND<50
			3/13/2013	ND<50	ND<50
			9/19/2013	ND<50	ND<50
			3/20/2014	ND<50	ND<50
			9/11/2014	ND<50	ND<50
			3/25/2015	ND<50	ND<50
			9/23/2015	ND<50	ND<50
			3/29/2016	ND<50	ND<50
			9/28/2016	ND<50	ND<50
			3/22/2017	ND<50	ND<50
			9/20/2017	ND<50	ND<50
			3/15/2018	ND<50	ND<50
			9/19/2018	ND<50	ND<50
			3/15/2019	ND<50	ND<50
			9/18/2019	ND<50	ND<50
			3/17/2020	ND<50	ND<50
			9/11/2020	5.28	5.28
			3/23/2021	5.61	5.61
			9/16/2021	5.57	5.57
			3/3/2022	6.92	6.92
MW-3d	38	38 (100%)	3/15/2000	ND<50	ND<50
			9/13/2000	ND<50	ND<50
			3/23/2001	ND<50	ND<50
			9/13/2001	ND<50	ND<50
			3/11/2002	ND<50	ND<50
			9/18/2002	ND<50	ND<50
			3/20/2003	ND<50	ND<50
			9/17/2003	ND<50	ND<50
			3/10/2004	ND<50	ND<50
			9/21/2004	ND<50	ND<50
			3/22/2005	ND<50	ND<50
			9/15/2005	ND<50	ND<50
			3/8/2006	ND<50	ND<50
			9/6/2006	ND<50	ND<50
			3/6/2007	ND<50	ND<50
			9/18/2007	ND<50	ND<50
			3/11/2008	ND<50	ND<50
			9/10/2008	ND<50	ND<50
			3/18/2009	ND<50	ND<50
			9/16/2009	ND<50	ND<50
			3/2/2010	ND<50	ND<50
			9/8/2010	ND<50	ND<50
			3/10/2011	ND<50	ND<50
			9/14/2011	ND<50	ND<50
			3/21/2012	ND<50	ND<50
			9/12/2012	ND<50	ND<50
			3/14/2013	ND<50	ND<50
			9/19/2013	ND<50	ND<50
			3/19/2014	ND<50	ND<50
			9/10/2014	ND<50	ND<50
			3/25/2015	ND<50	ND<50
			9/23/2015	ND<50	ND<50
			3/24/2016	ND<50	ND<50

			9/29/2016	ND<50	ND<50
			3/24/2017	ND<50	ND<50
			9/21/2017	ND<50	ND<50
			3/16/2018	ND<50	ND<50
			9/21/2018	ND<50	ND<50
MW-3R	7	7 (100%)	3/14/2019	ND<50	ND<50
			9/20/2019	ND<50	ND<50
			3/17/2020	ND<50	ND<50
			9/12/2020	ND<2	ND<2
			3/26/2021	ND<2	ND<2
			9/17/2021	ND<2	ND<2
			3/5/2022	ND<2	ND<2

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

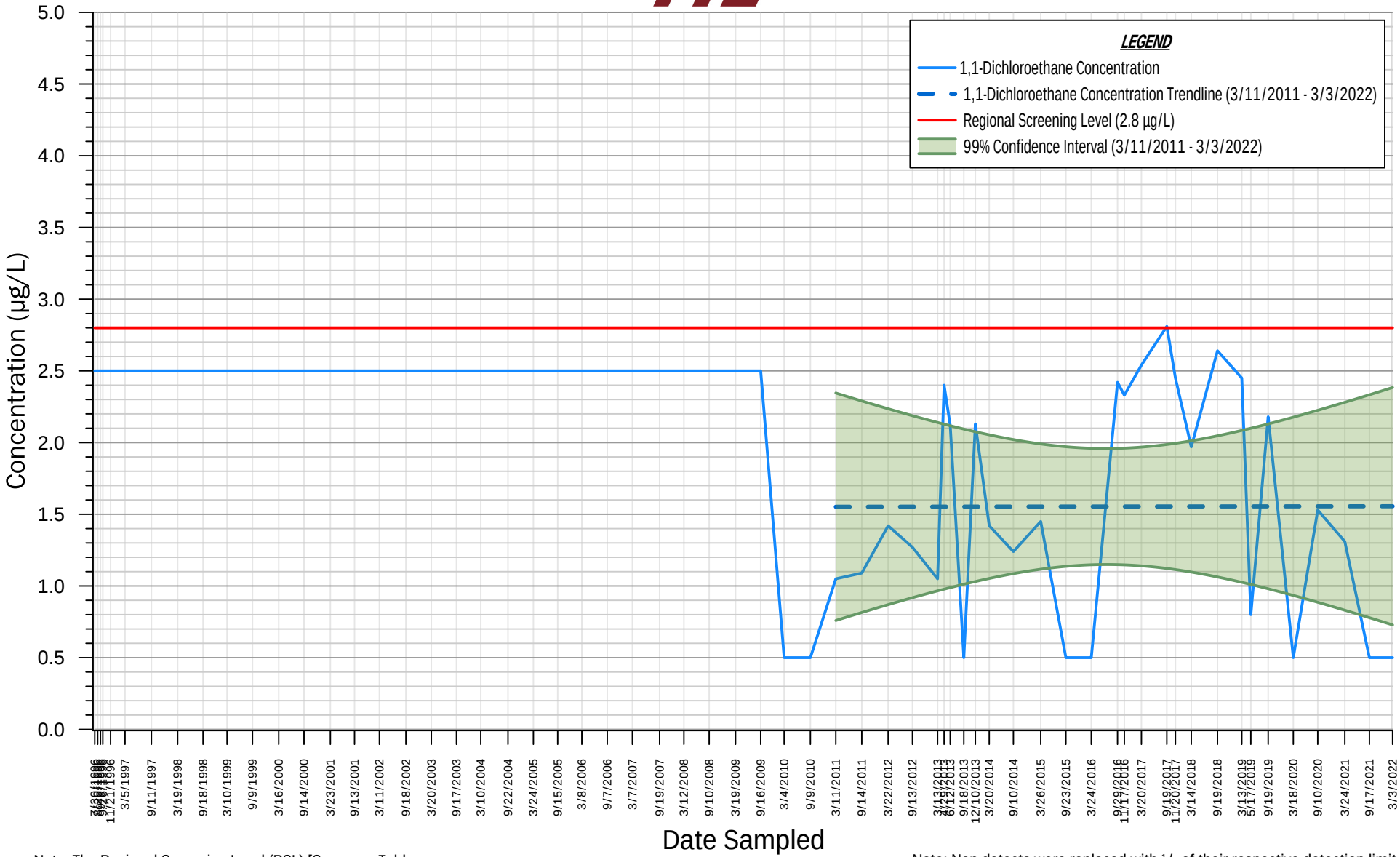
MW-8 Time Series Graph

1,1-Dichloroethane

07/30/1996 - 03/03/2022

Black Warrior Solid Waste Disposal Authority

Permit No. 63-01



Note: The Regional Screening Level (RSL) [Summary Table (TR=1E-6, HQ=0.1) April 2019] for 1,1-Dichloroethane is 2.8µg/L.

Note: Non-detects were replaced with $^{1}/_{2}$ of their respective detection limit.

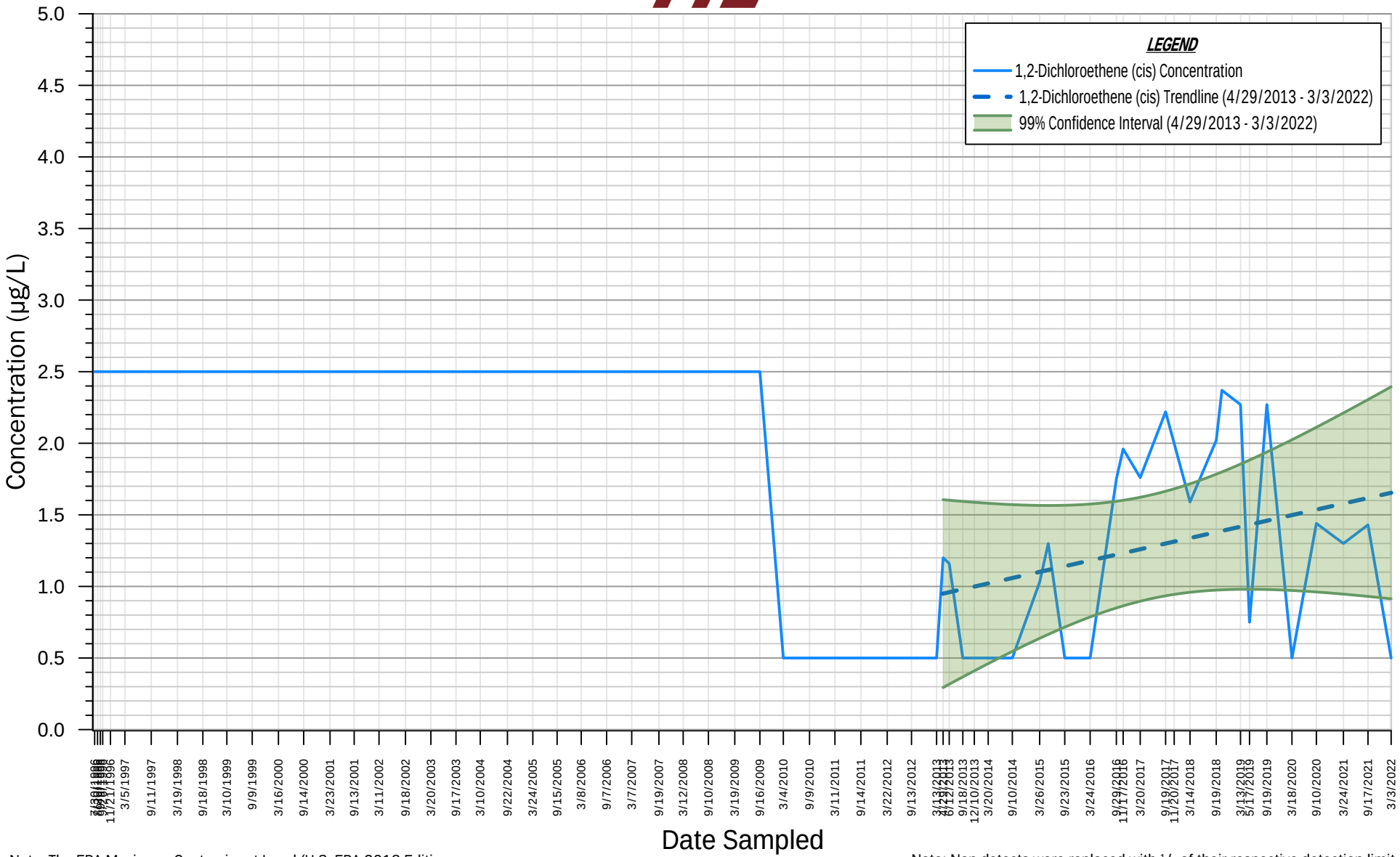
MW-8 Time Series Graph

1,1-Dichloroethane

07/30/1996 - 03/03/2022

Black Warrior Solid Waste Disposal Authority

Permit No. 63-01



Note: The EPA Maximum Contaminant Level (U.S. EPA 2018 Edition of the Drinking Water Standards and Health Advisories) for 1,2-Dichloroehtene(cis) is 70µg/L.

Note: Non-detects were replaced with $^{1}/_{2}$ of their respective detection limit.

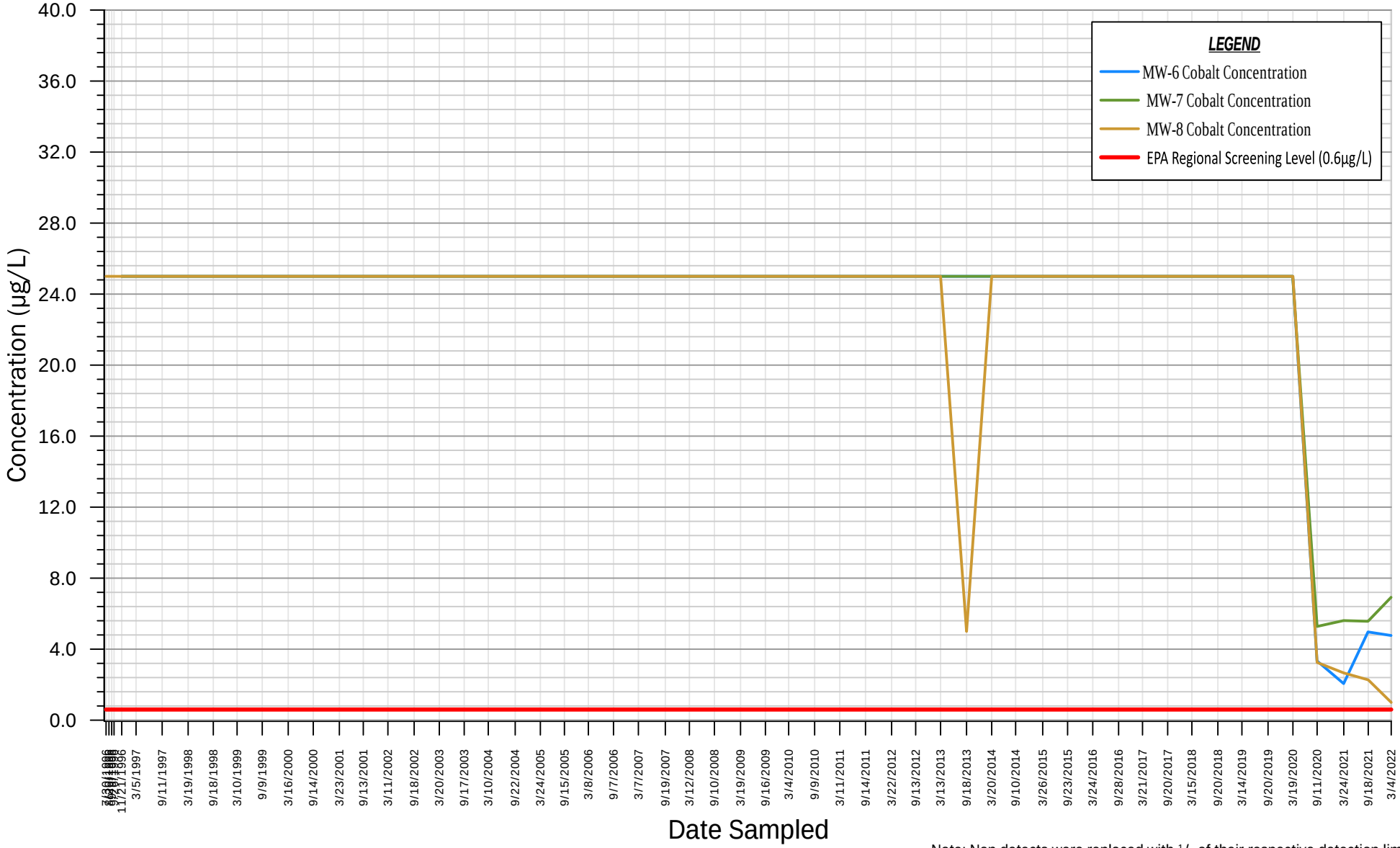
Multi-well Time Series Graph

Cobalt

07/30/1996 - 03/04/2022

Black Warrior Solid Waste Disposal Authority

Permit No. 63-01



Note: Non-detects were replaced with $^{1}/_{2}$ of their respective detection limit.

REVISED GROUNDWATER MONITORING PLAN

BLACK WARRIOR SOLID WASTE AUTHORITY FACILITY
COKER, TUSCALOOSA COUNTY, ALABAMA
PERMIT NO: 63-01

Submitted to:

Black Warrior Solid Waste Authority
3301 Landfill Drive
Coker, Alabama 35452

Prepared by:

TTL, Inc.
3516 Greensboro Avenue
Tuscaloosa, Alabama 35401

Project No. 600107003.22 (Rev.3)

March 23, 2022

PREFACE

This Groundwater Monitoring Plan was initially issued as part of the facility Project Manual (Volume II, Section 10.0 Landfill Monitoring), dated October 1994, revised March 1995, and again in revised March 1998). The original Project Manual was prepared by Carter, Darnell and Grubbs Engineers, Inc. with contributions by TTL, Inc. This Groundwater Monitoring Plan has been revised and updated to reflect modifications to the original Groundwater Monitoring Plan.

CERTIFICATION

I certify that I am a qualified groundwater professional, demonstrated by an Alabama state license as a professional geologist. I have sufficient training and experience in groundwater hydrology and related fields to make sound professional judgments regarding groundwater monitoring and contaminant fate and transport. I further certify that the data in this report has been prepared by me and/or a subordinate under my direction.

Name: J. Mark Tanner, P.G.
Senior Principal Geologist
Alabama License No. 247

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1.0 LANDFILL MONITORING

1.1 Groundwater Monitoring System

The revised Groundwater Monitoring Plan, dated March 1998, included a Groundwater Monitoring System comprised of nine groundwater monitoring wells (MW-1 through MW-9). The nine monitoring wells were installed in January of 1996 and were screened within the first zone of saturation underlying both the existing and proposed landfill cells. Since March of 2000, the measured depth to groundwater in monitoring well MW-3 has increased by 2.5 feet. On behalf of the Black Warrior Solid Waste Authority (BWSWA), TTL submitted a Proposed Limited Alternate Source Determination (ASD) Work Plan to the ADEM on December 21, 2019. The proposed Work Plan listed numerous field activities including, the replacement of monitoring well MW-3 with a new monitoring well designated MW-3R and the abandonment of monitoring well MW-3. Monitoring well MW-3 was ultimately abandoned on January 28, 2019 and replacement well MW-3R was installed on January 25 and 28, 2019.

The current groundwater monitoring system consists of nine groundwater monitoring wells, identified as MW-1, MW-2, MW-3R, and MW-4 through MW-9. In accordance with the permit and submitted request for minor modification, monitoring wells MW-1 and MW-2 are designated as “upgradient” and monitoring wells MW-3R, MW-4 through MW-9 as “downgradient” wells. Monitoring wells MW-1 and MW-2 are located immediately upgradient of landfill cell 4 and proposed landfill cell 12 in the northeast portion of the landfill. Monitoring wells MW-3R and MW-4 are located immediately west of landfill cells 2 and 3. Monitoring wells MW-5, MW-6, and MW7 are located immediately southwest of landfill cell 1 in the southwest portion of the landfill. In addition, MW-8 and MW-9 are located southeast of proposed landfill cells 11B and 15, respectively. It should be noted that monitoring wells MW-8 and MW-9 are located downgradient of the former location of the unlined pre-Subtitle D landfill. The locations of the groundwater monitoring wells are shown on Figure A-II (Appendix A) for reference.

1.1.1 Groundwater Monitoring Program

The groundwater monitoring program will comply with ADEM Administrative Code R 335-13-4-27 (7/26/96 revision). The program will, therefore, comply with the requirements for sample collection, sample preservation and shipment, analytical procedures, chain-of-custody control, quality assurance and quality control, statistical evaluation of groundwater monitoring data, detection monitoring, assessment monitoring, and corrective action. The program incorporates permanent and/or temporary monitoring elements to provide environmental protection during and after landfill development. The Black Warrior Solid Waste Authority is an existing Subtitle D landfill currently operated under permit number 63-01. This updated monitoring program supersedes earlier versions and is written to include monitoring of the existing wells.

1.1.2 Sample Collection

Environmental quality sampling at the site will be accomplished by personnel trained in sampling protocol and will be consistent with ADEM guidance and ASTM Standards. As site conditions change, activities related to monitoring at the site will be continually reviewed and scrutinized for completeness and integrity. In order to ensure the integrity of the collected groundwater samples, considerable effort will be directed toward optimizing the sampling protocol and refining it as more information becomes available. The protocol for collection of the groundwater sampled will be documented and reported to the ADEM with the analytical results.

1.1.3 Well Inspection

Prior to performing any purging or sampling, each monitoring well will be inspected to assess its integrity. The condition of each well will be evaluated for physical damage that may have been caused by site equipment or other vehicular traffic. The security of each well will be assessed to confirm that outside source contaminants have not been introduced into the well. Inspection information, as well as the date and time, general weather conditions, and sampling personnel identification, will be documented on a Field Information Form (Appendix C). The actual form that is utilized may vary in format. Field personnel will record, at a minimum, the following:

- Date, time, and sampler's name
- Well number, elevation of measuring point, well depth, and depth to water
- Well casing material and inside diameter
- Static water level prior to purging
- Sampling equipment used
- Volume of water purged prior to sampling
- Sampling equipment used
- Volume of water purged prior to sampling
- Sample container numbers, types, sizes, and preservatives
- pH, specific conductance, temperature, and turbidity of water samples
- Comments about sample color, odor, and unusual characteristics
- Comments about weather conditions
- Comments about accessibility and condition of well

1.1.4 Monitoring Well Abandonment/Replacement

If it is determined that a well should to be replaced for any reason, a Monitoring Well Abandonment and Replacement Plan (the Plan) will be prepared for submittal to ADEM within 60 days of making the determination. The Plan will include, at a minimum, consideration of the following:

- The appropriate method for abandonment.
- The need for relocation to protect the replacement well from future damage.
- The anticipated replacement well type, depth, screened interval, casing diameter and surface completion in accordance with ADEM Admin Code 335-13-4-.27(2)(c).
- The need for replicate sample collection and if required, the number of replicate samples and a schedule for completing sample collection.
- Statistical analysis to be used for groundwater quality data collected from the replacement well and a determination addressing pooling data from the abandoned well with the new well is appropriate.

Upon approval of the Plan and the replacement of the new well, a report documenting the abandonment and replacement activities will be prepared and submitted to ADEM along with a Minor Permit Modification request to update the facility Permit and include the newly installed well into the Permit compliance well network.

1.1.5 Sample Collection Procedures

For sample collection, each monitoring well in the groundwater monitoring system will be sampled with dedicated equipment and methodologies that minimize the potential for alteration or contamination of the sample and that are capable of cleaning sampling equipment on the ground or on any contaminated surface. Additionally, personnel who contact sampling equipment that may contact the

interior of the monitoring well or the groundwater will don powderless latex gloves. If applicable, non-contaminated well(s) or typically upgradient wells will be sampled prior to those wells which are known to be impacted (typically downgradient wells).

1.1.6 Equipment Decontamination

Although use of non-dedicated equipment is discouraged, any non-dedicated well equipment that may contact the interior of the well or groundwater will be decontaminated in the field immediately prior to use, or in the office/lab and protected using aluminum foil and/or plastic bags. However, for any sampling events requiring non-dedicated sampling equipment, decontamination procedures will consist of rinsing the equipment once with deionized or laboratory reagent-quality water, brushing the equipment with a laboratory-quality soap such as Liquinox, and triple rinsing the equipment with deionized or laboratory-reagent quality water.

1.1.7 Water-level Measurements

Prior to groundwater purging and sampling, water-level measurements will be made at each well location by utilizing a portable electronic water-level indicator, tape, or other suitable measuring device, capable of achieving an accuracy of 0.01 foot. Wells will be measured for depth to water on the same day and immediately prior to purging. The measuring device will be used in accordance with the manufacturer's recommendations and/or directions. Prior to measuring, equipment that may contact the groundwater will be decontaminated by triple rinsing with distilled or deionized water. Measurements of the depth to water from a surveyed reference datum (the top of the well casing) will be to the nearest 0.01 foot, and the values will be recorded on the ADEM Groundwater Monitoring Report Form (Appendix C). Total well depths shall be obtained as necessary if there is evidence of well tampering or siltation.

1.1.8 Well Evacuation/Purging

Immediately prior to sampling, the water within the well will be evacuated until measured water-quality parameters indicate that formation water has entered the well or to sufficient volume to assure that stagnant water has been purged from the well. The wells will be evacuated using the standard 3 to 5 well-volume purging method or by low-flow (minimal drawdown) sampling methods. Low-flow sampling methods are preferred. If low-flow methods are used, they will be in accordance with EPA/540/S-95/504, "Low-flow (Minimal Drawdown) Groundwater Sampling Procedures".

Purging may be considered complete when: Standard 3 to 5 well volume method - A minimum of three (3) well volumes (based upon well- construction records) have been evacuated from the well and two of the field measured parameters (pH, specific conductance, temperature, and turbidity) have stabilized, or to five (5) well volumes, or until the well is pumped/bailed dry; or
Low-flow - Two of the field measured water-quality parameters have stabilized (measured within 15% relative to previous measurements).

If three well volumes cannot be obtained due to the well being pumped or bailed dry, the well will be allowed to recover and then the samples will be collected. If sufficient water is not available for sampling within 24 hours of purging for slowly recovering wells, the well will be considered dry, and no sample will be collected.

Low-flow sampling will be performed only if dedicated pumps have been installed in each well. If low-flow (or minimal drawdown) techniques are used, purging will be with flow-control submersible bladder pumps. Purging rates will be monitored and depth to water measurements recorded to assure that evacuation rates do not induce a substantial lowering of the water within the well. Flow rates will vary

for each well, but rates of approximately 0.1 to 0.5 L/min are typical. Pump discharge lines will be purged prior to collecting field parameter samples for field analysis with appropriate meters.

1.1.9 Sample Withdrawal & Collection

Samples will be collected from each well using either a dedicated (or disposable) Teflon or polyethylene bailer or through the discharge of pumps used to evacuate the well. Samples will be collected at a rate that minimizes potential alteration of the sample due to agitation or oxidation. Pumping rates for collection of samples for volatiles analysis (VOA's, etc.) will be approximately 0.1 L/min or less, to the extent practical based on the sampling equipment. Pumping rates for collecting other samples may be increased, but will be adjusted to a rate that also prevents chemical alteration.

If low-flow sampling methods are employed, the sampling rate will not exceed the purging rate, with flow rates of approximately 0.1 to 0.5 L/min recommended (EPA/540/S-95/504). Sampling pumps will be operated in a continuous manner so that they do not produce samples that are aerated in the discharge tube. Groundwater samples will be collected as soon as possible after purging.

1.1.10 Sample Preservation & Shipment

Samples will be collected and containerized in the order of the volatilization sensitivity of the parameter (i.e., volatile organics, organic compounds, inorganic species, and major cations and anions). Sample containers of the appropriate size and type, and with the preservatives appropriate for the analytical tests to be performed from the sample, will be prepared and labeled by the independent testing laboratory utilized by the facility. The laboratory will specify the preservation methods based on knowledge of methods and procedures approved by ADEM and/or EPA. The facility owner/operator will contract for services with a laboratory that meets these requirements.

Holding times, storage conditions, and transport conditions are important elements of the sampling protocol. They will be identified from references such as the most recent edition of SW-846 (Test Methods for Evaluating Solid Waste; PhysicaVChemical Methods; EPA SW-846) and Standard Methods for the Examination for Water and Wastewater. Samples will be packaged securely in an iced cooler (kept at or bellows a temperature of 4 °C) and transported to the analytical laboratory following strict chain-of-custody protocol.

1.1.11 Chain of Custody

Each sample container will be individually identified as to sample number, date and time of collection, and source of sample. A chain-of custody record will be prepared for all samples that will include:

a) Name of the person collecting the samples;
b) Identity of each sample (soil or water);
c) Source of each sample (monitoring well identifier);
d) Preservation provisions for each sample;
e) Analytical requirements; and
f) Name of person accepting sample.

Custody transfers of samples will be recorded on the chain-of-custody form by signatures of the transferor (relinquisher) and the transferee (receiver). This procedure will be repeated, as necessary, until final delivery is made to the analytical laboratory.

1.1.12 Analytical Procedures

Groundwater samples will be analyzed for the constituents specified in the detection-monitoring program. Where appropriate, assessment monitoring may be required. No specific analytical methods are cited in the regulations although suggested analytical methods are listed. The suggested methods are those EPA-approved methods and procedures that are published in SW-846. The laboratory under contract to the facility shall use one of the approved methods.

1.1.13 Practical Quantitation Limits (PQLs)

BWSWA proposes to utilize laboratory-specific PQLs as the reporting limits of applicable low-detection analytes (especially organics). The USEPA developed the concept of the PQL to address the issue of analytical variability. The PQL concept was developed for compliance with the Safe Drinking Water Act (50FR46906, Nov. 13, 1985) where it is defined: "The PQL thus represents the lowest level achievable by good laboratories within specified limits during routine laboratory operating conditions." A nationally recognized analytical laboratory will be contracted to perform sample analysis and the laboratory will typically be capable of meeting the applicable ADEM water- quality standards.

1.1.14 Quality Assurance & Quality Control

A quality-assurance and quality-control program (QA/QC) will be part of the sampling protocol and a requirement for the laboratory chosen to provide analytical services. Field QA/QC per sampling event will require, at least, the collection of two types of blanks: trip blanks and equipment-rinsate blanks for non-dedicated equipment. Procedures for collecting and evaluating these blanks, as described in the EPA Handbook Groundwater; Volume II: Methodology (EPA/625/6- 90/01b), will be followed.

The laboratory QA/QC program will be a written program, a copy of which will be available to the owner/operator. This program will describe the precision, accuracy, and completeness of the laboratory data; the documentation of procedures for calibration and maintenance of laboratory equipment, for analysis of samples, for computing and validating test data, and for chain-of-custody control; and the control and security of all documentation. Laboratory QA/QC standards wills be initialed with the receipt of samples and will be maintained throughout the recordkeeping period.

1.1.15 Detection Monitoring Parameters

The initial detection monitoring parameters for the BWSWA will be the constituents in Appendix I to ADEM Administrative Code R. 335-13-4-27. The Landfill also may monitor groundwater for major leachate indicator parameters (such as total dissolved solids and alkalinity) and for major cations and ions (such as calcium, magnesium, sulfate, and carbonate). Further, the Landfill may collect and analyze leachate samples. Monitoring for the additional groundwater parameters and characterizing the leachate will be independent of the permit requirements.

ADEM Administrative Code R. 333-13-4-.27(3)(a)3 allows the Department to delete any of the detection monitoring parameters if it can be shown that the removed constituents are not reasonably expected to be contained in or derived from the waste contained in the unit. ADEM Administrative Code R. 333-13-4-.27(3)(a)4 allows the Department to establish an alternative list of inorganic indicator parameters in lieu of some or all of the heavy metals (constituents 1 through 16 in Appendix I) if the alternative parameters provide a reliable indication of inorganic releases from the municipal solid waste landfill (MSWLF) unit to the groundwater.

1.1.16 Detection Monitoring Frequency

Detection Monitoring will be performed in March and September of every year during the active life of the facility (including closure) and during the post-closure period unless the Department specifies an alternative monitoring frequency.

1.1.17 Inter-well Comparisons

Two general approaches to groundwater monitoring at waste disposal facilities are: (1) inter-well comparisons by which new downgradient monitoring measurements are compared to water-quality measurements obtained from wells that are hydraulically upgradient to the facility; and (2) intra-well comparisons by which new downgradient measurements are compared to their own history. In general, intra-well monitoring is preferable to inter-well monitoring because it eliminates the spatial component of natural groundwater chemistry variability. This spatial component comprises a significant portion of the total variability that must be accounted for by the statistical methodology. In accordance with Admin. Code r. 335-13-4-.27(2)(1) and the facility's current permit, the collected groundwater analytical data will be statistically evaluated using the inter-well comparison approach.

The compiled groundwater analytical data has been historically evaluated using the inter-well statistical approach in which downgradient compliance concentrations in a given well are compared to upgradient background concentrations. In accordance with ADEM Administrative Code R 335-13-4-.27(1)(3), a tolerance or prediction interval procedure will be used to evaluate groundwater monitoring data. An appropriate variation of this method will be used for each constituent. This method can be used for all constituents because it allows for the construction of either one-sided or two—sided intervals from either parametric or nonparametric distributions of data, and because various adaptations of the method account for varying percentages of data below the laboratory's PQL. This method will be used as long as the continuing assessment or groundwater monitoring data accumulated from the site supports its appropriateness. If the site data provides evidence that an alternative statistical method should be used, this evidence will be submitted to ADEM to justify the request for ADEM's approval to use another method.

1.1.18 Background Monitoring

After each new well is constructed, samples will be collected for a total of eight sampling events to specifically provide background groundwater quality data. Samples from the eight older wells (MW-1, MW-2, MW-4 through MW-9) will be collected concurrently with samples from new well(s) and evaluated as detection monitoring wells, in accordance with this monitoring plan. Additional background indicator data may be collected from the existing wells for further characterization as described in Section 1.1.14.

During background sample collection, the data will be examined for outliers, anomalies, and trends that might indicate a release. Outliers and anomalies are inconsistently large or small values that can occur due to sampling, laboratory, transportation or transcription errors, or even by chance alone. Significant trends indicate a source of systematic error or an actual contamination occurrence that must be evaluated and corrected before the detection monitoring program can be implemented. The inclusion of such values in the historical database used for statistical evaluation could cause misinterpretation of the data set, and result in an artificial increase in the magnitude of statistical limits, which could result in an increase in the false negative rate (i.e., a decrease in the sensitivity of the statistical procedure).

To remove the possibility of historical outliers and trends creating false statistical limits, the data for each well and each constituent will be tested for the existence of outliers. Outliers may be removed

from consideration during the establishment of all statistical limits. The statistical outlier and trend detection procedure will be performed for those wells that have had at least 5 measurements for a given constituent. Once the background database is established, the outlier procedure described above may be applied and appropriate statistical limits set in accordance with the appropriate statistical method.

1.1.19 Statistical Methods

Statistical analysis is required by the Rules of the ADEM, Solid Waste Management (Chapter 335-13-4-.27). The purpose of statistical analysis is to identify whether any monitored constituents are detected in amounts that constitute an statistically significant increase (SSI) relative to background concentrations. If a groundwater constituent is detected at a level determined to represent an SSI above background values and the SSI cannot be attributed to errors in sampling, laboratory analysis, statistical evaluation, or natural variation in groundwater quality, the facility is typically required to initiate (or continue) Assessment Monitoring, as required by ADEM Admin. Code r. 335-4-.27(3)(c)2.

In the application of statistics to groundwater monitoring data from this site, all data will be treated as independent and representative of the quality of the groundwater at the site. Statistical methods used, and their application to data from this site, meet the EPA standards referenced in *Statistical Analysis of Groundwater Monitoring Data Unified Guidance* document. The March 2009 Unified Guidance document provides guidance for the statistical analysis of groundwater monitoring data from RCRA facilities. It updates and replaces the earlier *1989 Interim Final Guidance* and the associated *July 1992 Addendum*.

If a constituent has been detected in a compliance monitoring well then it is required that statistical analysis for determination of an SSI be performed for that constituent/compliance well pair. However, before an SSI can be declared, the constituent/compliance well pair should be re-sampled to confirm (or disconfirm) the concentration value which prompted the initial indication of an SSI.

Typically, the first step in the statistical analysis process is that the entire dataset (background and compliance) is subjected to a distribution analysis to determine if the data is normally distributed or can be transformed (i.e., log-normal distribution). If data is not normal, or cannot be transformed, a non-parametric prediction limit statistical analysis method is recommended. If data is normal, or can be transformed, a parametric prediction limit statistical analysis method is recommended. However, when the data contains a significant percentage of non-detects (defined as greater than 10-15%), the validity of distribution tests are questionable and it is suggested that a non-parametric prediction limit method be used.

Parametric and non-parametric prediction limit statistical analysis methods can be performed as an inter-well test (utilizing sample data from a designated background well) or as an intra-well test (utilizing sample data from the historical results of the constituent/compliance well). In either case, a comparison is made of each individual compliance concentration for the most recent event to the maximum concentration in background samples. The non-parametric prediction limit method does not produce an actual limit, but simply a maximum value of the constituent concentration above which contamination is assumed. It should be noted that the Unified Guidance suggests that all non-detects should be replaced with one-half (½) of the RL for the purpose of identifying the prediction limit (i.e., maximum background concentration) for parametric prediction interval analysis. For the purpose of identifying the prediction limit for non-parametric prediction interval analysis, all non-detect values should be reduced to zero. For reporting purposes, the laboratory represents all non-detects as being less than the RL (e.g., ND<100) for each constituent. The reduction of non-detect values to zero would be necessary due to differences in RLs used throughout the monitoring history for the facility. By reducing the non-

detects to zero, the ChemStat program would use confirmed values as the prediction limit instead of the RL since it is unknown what values the non-detects truly represent.

The May 2009 Statistical Analysis of Groundwater Monitoring Data Unified Guidance recommends the use of confidence intervals as a general statistical strategy for comparing groundwater analytical data to Groundwater Protection Standards (GWPSs) to determine if groundwater concentrations statistically exceed established standards. A confidence interval around the mean is designed to estimate the true average of the underlying population, while at the same time accounting for variability in the sample data set. Confidence limit intervals [Upper Confidence Limits (UCLs) and Lower Confidence Limits (LCLs)] can be constructed around the population median (50th percentile) for constituent/compliance pair sample data. These limits define the range in which the true concentration should be expected to exist. The Unified Guidance recommends that the null hypothesis (i.e., the assumption that the compliance concentration is less than an established standard) is not true when the entire confidence interval, including the LCL, exceeds the established standard. Therefore, as long as the LCL for a specific constituent is less than or equal to the established standard, the constituent/well data indicates that no statistical exceedance of the GWPS has occurred. However, if the LCL for specific constituent/well data exceeds an established MCL or GWPS, then there is statistically significant evidence that the population median is greater than the GWPS and an ASD or an Assessment of Corrective Measures (ACM) may be warranted.

To calculate an LCL around the median with 99% confidence, a minimum of seven compliance point measurements are required in order to calculate a non-parametric confidence interval. Considering that generating LCLs involves an iterative testing procedure (i.e., ranking of analytical data from lowest to highest concentrations), laboratory non-detect values were set to zero (0) prior to any ranking of the data. Substituting zero (0) for non-detect values is performed to ensure that a non-detect value is never ranked higher than a detected value.

The Unified Guidance recommends using trend tests in detection monitoring to measure the extent and nature of an apparent concentration increase, especially to determine whether or not the increase occurs consistently over time. Trend tests graphically depict a positive or negative trends over a period of monitoring. By identifying a positive trend, one can show that contaminant levels have gotten worse in comparison to early measurements from the well being tested. Furthermore, by measuring the nature of the trend, including the average rate of increase per unit of time, one can estimate how rapidly concentrations leveled are increasing and the current mean or median-level magnitude of contamination. Trend Testing methods, as outlined in Chapter 17 of the Unified Guidance, for each statistical exceedance will be submitted with each groundwater monitoring report.

1.1.20 Detection Verification Procedures

If detection monitoring results is determined initially to be above the appropriate statistical level, the result with be verified. Verification re-sampling is an integral part of the statistical methodology described by U.S. EPA's Addendum to Interim Final Guidance Document - Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (July 1992). Without verification re-sampling, much larger statistical limits would be required to achieve site-wide false-positive rates of 5% or less. Furthermore, the resulting false-negative rate would be greatly increased. Only compounds that initially exceed their statistical limit will be sampled for verification purposes.

Volatile Organic Compounds (VOCs): If one or more VOCs are detected above their statistical limit (i.e., PQL), a minimum of one verification resample will be conducted. If two re-sampling events are conducted, the samples will be collected independently, no sooner than 30 days apart. A statistical exceedance will be recorded and alternate source identification or assessment monitoring initiated if any single VOC is measured above the PQL in each of the verification resamples. It should be noted

that based on the Alabama Groundwater Report Guidance for Solid Waste Facilities, dated March 2011, "the detection of any organic constituents is considered an SSI."

Inorganic Constituents: If one or more of the inorganic parameters are detected above their statistical limit (i.e., Shewart-CUSOM control chart computation value/prediction limit), a minimum of one verification resample will be collected at the next scheduled sampling event. If the exceedance is confirmed during the next event, a second verification re-sampling event may be completed within 30 days. A statistical exceedance will be recorded and alternate source identification of assessment monitoring initiated if verification of two or more elevated parameters is confirmed for each of the discrete verification resamples.

1.1.21 Assessment Monitoring

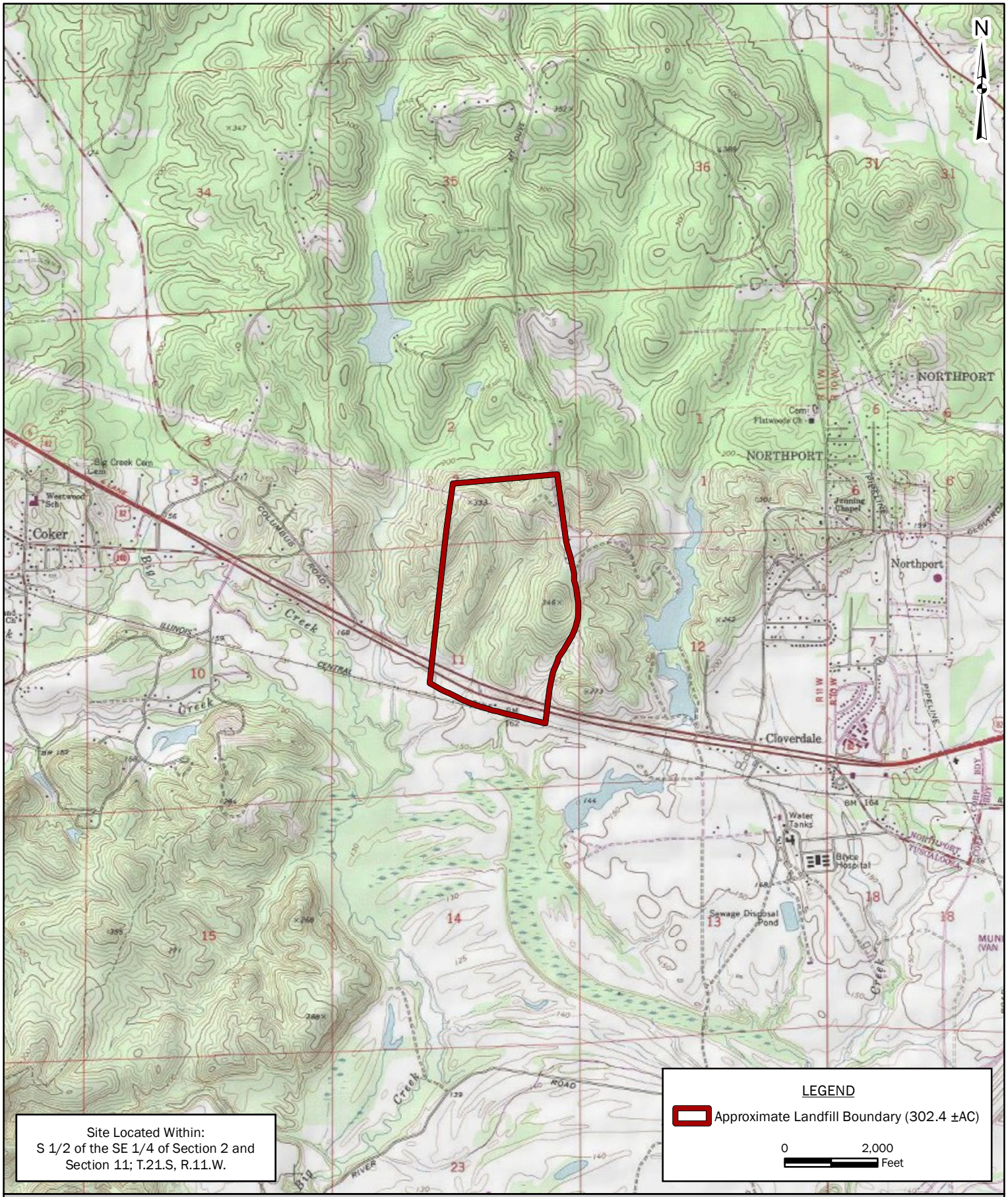
Assessment monitoring, if required, will be in accordance with ADEM Administrative Code R. 335-13-4-.27(4).

1.1.22 Corrective Action

Corrective action, if required, shall be conducted in accordance with ADEM Administrative Code R. 335-13 -4-.27(5).

APPENDIX A: Figures

Figure 1: Site Location & Topographic Map
Figure 2: Site Layout Map



TTL

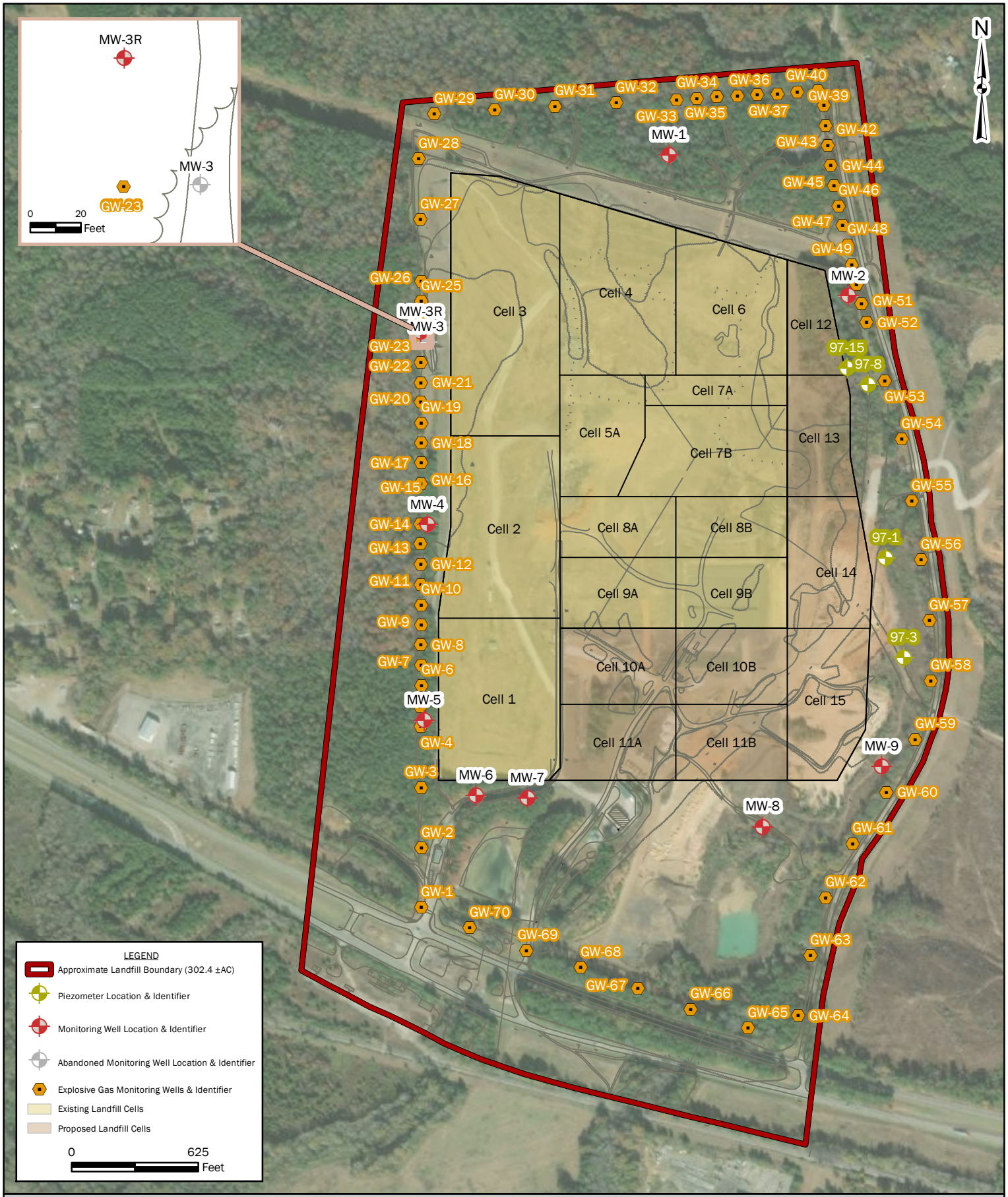
FIGURE 1: SITE LOCATION & TOPOGRAPHIC MAP
BLACK WARRIOR SOLID WASTE AUTHORITY
ADEM PERMIT NO.: 63-01

3301 LANDFILL DRIVE

COKER, TUSCALOOSA COUNTY, ALABAMA

BASEMAP: Lake Lurleen, Alabama USGS 7.5 Minute Quadrangle Map, 1978 (Photorevised 1982) and Coker, Alabama USGS 7.5 Minute Quadrangle Map, 1969 (Photorevised 1978)

DRAWN BY: AGW
CHECKED BY: JMT
DRAWING DATE: 6/24/2019
REVISION DATE: N/A
TTL JOB NO.: 600107003
Approximate Scale: 1" = 2,000'



TTL

FIGURE 2: SITE LAYOUT MAP
BLACK WARRIOR SOLID WASTE AUTHORITY
ADEM PERMIT NO.: 63-01
3301 LANDFILL DRIVE
COKER, TUSCALOOSA COUNTY, ALABAMA
BASEMAP: DigitalGlobe, 1/26/2017

DRAWN BY:	AGW
CHECKED BY:	JMT
DRAWING DATE:	12/19/2018
REVISION DATE:	12/9/2019
TTL JOB NO.:	600107003
Approximate Scale:	1" = 625'

APPENDIX B: Field Information Form & ADEM Groundwater Monitoring Report Form

GROUNDWATER MONITORING REPORT

Facility Name: _____ **TTL Project No.:** _____

Sample Date: _____ **Time:** _____ **Person Collecting Sample:** _____

Purge Date: _____ **Well Number:** _____ **Top of Casing Elevation (MSL):** _____

Diameter of Well Casing: _____ **inches** **Well Casing Material:** _____

Total Depth of Well (TD): _____ **feet** **Depth to Water (DW):** _____

One Well Volume: _____ **gal** **X3** _____ **gal** **X5** _____ **gal**

Purging Equipment: _____ **Sampling Equipment:** _____

Field Parameter Equipment (brand & SN): _____

Time												
Volume (gal.)												
Water Level (ft.)												
Temperature (°C)												
Sp. Cond. (µmhos)												
pH												
D.O.												
ORP												
Turbidity (NTU)												
Pump Setting												
Carbon Dioxide												
Iron II												
Alkalinity												
Sulfide												

Total Volume Purged: _____ **gal** **Color of Sample:** _____ **Odor of Sample:** _____

Weather Conditions: _____

Accessibility of Well: _____ **Condition of Well:** _____

Unusual Characteristics: _____

Other Comments: _____

GROUNDWATER MONITORING FORM

PROJECT NAME: _____ TTL PROJECT No: _____

SAMPLING DATE: _____ TIME: _____ PERSON COLLECTING SAMPLE: _____

WELL NUMBER: _____ TOP OF CASING ELEVATION (MSL): _____ ft

TOTAL DEPTH OF WELL: _____ ft BLS DEPTH TO WATER: _____ ft BMP

VOLUME REMOVED BEFORE SAMPLING: _____ gal.

INSIDE DIAMETER OF WELL CASING: _____ in. WELL CASING MATERIAL: PVC

SAMPLING EQUIPMENT: (BAILER, PUMP, ETC.): _____

Specific conductance	_____	(µmhos/cm)
pH	_____	(standard units)
Temperature	_____	(degrees in F or C)
Turbidity	_____	(NTUs)
Odor of sample	_____	
Unusual characteristics	_____	
Filter size, if filtered	_____	
Weather Conditions	_____	
Accessibility of well	_____	
Condition of well	_____	
Other comments	_____	

_____
Field Representative

LANCE R. LEFLEUR
DIRECTOR

KAY IVEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov
1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

April 26, 2022

MEMORANDUM

To: Jared Kelly, Chief
Engineering Section
Solid Waste Branch

Through: Billie Jean Wascher, Chief
Groundwater Protection Unit
Hydrogeology Section
Groundwater Branch

Through: Jessica Rayfield
Compliance and Enforcement Section
Solid Waste Branch

Through: Hunter Baker DHB
Engineering Section
Solid Waste Branch

From: Gigi Copeland GMC
Groundwater Protection Unit
Hydrogeology Section
Groundwater Branch

Re: **Revised Groundwater Monitoring Plan**
Black Warrior Solid Waste Disposal Authority
Permit No. 63-01

Summary

The Department received the Revised Groundwater Monitoring Plan (GWMP) for the Black Warrior Solid Waste Disposal Authority (BWSWDA) dated March 23, 2022 and the correspondence dated March 23, 2022 which was submitted by TTL, Inc. in response to the ADEM comments dated February 14, 2022. The ADEM Solid Waste Branch requested that the Groundwater Branch evaluate the submittals and provide pertinent comments and recommendations. This report is a result of that request.

The submitted Response to Comments and Revised GWMP adequately address the concerns expressed in the ADEM letter dated February 14, 2022. There are no additional comments on the GWMP at this time.

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)

Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
3664 Dauphin Street, Suite B
Mobile, AL 36608
(251) 304-1176
(251) 304-1189 (FAX)

July 8, 2022

Hunter Baker
Permit Engineer
Alabama Department of Environmental Management
P.O. Box 301463
1400 Coliseum Boulevard
Montgomery, AL 36110
United States

Re: Black Warrior Solid Waste Facility, Permit 63-01
ADEM Request for Supplemental Information

Dear Mr. Baker,

On behalf of the Black Warrior Solid Waste Disposal Authority please accept this letter in response to your email received on Thurs June 23, 2022. In the email it is stated that ADEM is requiring some additional supplemental information in order to process the Facility's permit renewal. The information requested via email is

ADEM's Supplemental Information Request:

A description of submittals (relevant permit actions, dates) of the following:

1. Original and any subsequent local approvals.

BWSWDA has received local government approval for the expansion of the permitted landfill area for Permit 63-01 by Ordinance Number 1809 adopted at public meeting on May 6, 2013 by the City Council of the City of Northport, Alabama (the "Ordinance"). The Ordinance was adopted after due publication of the public meeting, the consideration of the six factors required by Section 22-27-48(c); and the opportunity for the public to be heard at said public meeting. To our knowledge, no other local government approval has been received by BWSWDA. (Copy attached).

The landfill currently known as the Black Warrior Solid Waste Facility (the "Landfill) was originally owned by the City of Tuscaloosa, Alabama, under ground lease from the Alabama Department of Mental Health dated effective

April 20, 1977. We have examined a copy of Permit Application/Sanitary Landfill dated October 24, 1988 by the City of Tuscaloosa, Alabama to expand its existing facility from 47 acres to an additional 146 acres, totaling approximately 193 acres. The application appears also to convert the landfill into a "sanitary landfill."

The Solid Waste Disposal Authority of the City of Tuscaloosa, Alabama was formed in 1982 by the City of Tuscaloosa, Alabama, City of Northport, Alabama and Tuscaloosa County, Alabama to build a waste to energy incinerator in the City of Tuscaloosa to provide for the disposal of all solid waste from the City of Tuscaloosa, Alabama, City of Northport, Alabama and Tuscaloosa County, Alabama, and to pay for the incinerator, to provide steam to the B. F. Goodrich Tire Plant located nearby. A contract between the Solid Waste Disposal Authority of the City of Tuscaloosa, Alabama and the City of Tuscaloosa, Alabama, the City of Northport, Alabama and Tuscaloosa County, Alabama required that all waste from those government entities be taken to the incinerator to be burned pursuant to ADEM regulations. There were problems with the operation of the incinerator, so that in the event the incinerator was not in operation, it was the convention that the unburned solid waste was baled up and driven from the incinerator site to the Landfill operated by the City of Tuscaloosa, Alabama.

By 1993 it became apparent that the waste to energy incinerator project was not a success. The Black Warrior Solid Waste Disposal Authority was formed by the City of Tuscaloosa, Alabama, City of Northport, Alabama and Tuscaloosa County on August 2, 1993. The City of Tuscaloosa, Alabama deeded the Landfill site to the Solid Waste Disposal Authority of the City of Tuscaloosa, Alabama on December 28, 1993. By Agreement dated January 20, 1994, the Black Warrior Solid Waste Disposal Authority assumed all assets and liabilities of the Solid Waste Disposal Authority of the City of Tuscaloosa, Alabama, including the Landfill and ADEM Permit 63-01. On January 21, 1994, the Solid Waste Disposal Authority of the City of Tuscaloosa, Alabama deeded the Landfill site and the incinerator site to the Black Warrior Solid Waste Disposal Authority.

CONCLUSION: The application for expansion of the landfill and change to a sanitary landfill was dated October 24, 1988. Section 22-27-48 requiring local government approval did not come into existence until the 1989 Act 89-824. No provisions of the 1989 Act required applications prior to its effective date to be governed by the provisions of the 1989 Act. We conclude that local

government approval was not required for the application by the City of Tuscaloosa, Alabama dated October 24, 1988.

2. Current design drawings and calculations, and any subsequent amendments.

The current design drawings, calculations, and Operations Manual are titled "Permit Plans - Phase 4, Black Warrior Solid Waste Facility, Rev. January 2013". The current Operations Manual (including calculations) are those submitted concurrently with the Permit Plans titled above.

The ADEM approved a minor modification on 03/16/21 for modifications to the Fill Sequencing Plan. The modification consists of changing the cell layout within the current disposal footprint and resequencing the order of fill. All other permit conditions remained the same.

3. Current operations and closure plans and any subsequent amendments.

The current operations and closure plans are those submitted concurrently with "Permit Plans - Phase 4, Black Warrior Solid Waste Facility, Rev. January 2013" as noted above. The final closure elevations are indicated on Sheet 7 of 10.

4. Current gas monitoring plan and any subsequent amendments.

The current gas monitoring plan is included in the Operations Manual submitted concurrently with "Permit Plans - Phase 4, Black Warrior Solid Waste Facility, Rev. January 2013" as noted above with monitoring locations as indicated on Sheet 6 of 10.

The Gas Monitoring Plan is performed in accordance with current ADEM Division 13 regulations and is described in Section 10.3 of the Operations Manual (Operations Manual, Vol II, pages 10-9 through 10-11).

5. Current liner and leachate QA/QC plan and subsequent amendments.

The current liner and leachate QA/QC plan is included in the Operations Manual submitted concurrently with "Permit Plans - Phase 4, Black Warrior Solid Waste Facility, Rev. January 2013" as noted above. The liner and leachate QA/QC plan is performed in accordance with current ADEM Division 13

regulations and is described in Section 9 of the Operations Manual (Operations Manual, Vol II, pages 9-1 through 9-37).

6. Variance requests and ADEM approvals.

As noted on the current Permit, the Facility has received approval for three variances as described herein.

A variance is granted for the Black Warrior Solid Waste Disposal Facility from Rule 335- 13- 4-.22(1)(a) 2.(c) which states that a completed daily cell shall not exceed eight feet in vertical thickness measured perpendicular to the slope of the preceding cell. Under this variance, a completed cell shall not exceed fifteen feet in vertical thickness measured perpendicular to the slope of the preceding cell. The variance was granted on April 1, 2010.

The Permittee has been granted approval to utilize commercial tarp systems as an alternate daily cover. The commercial tarp system must be approved by the manufacturer for landfill use and the Permittee shall be required to follow manufacturer' s recommendations for installation and removal of the tarp system. At the conclusion of each week' s operation, the Permittee shall be required to cover at I exposed waste with a minimum of six inches of compacted earth. The variance was granted by ADEM on 03/31/2017.

The Permittee has been granted approval to utilize non-hazardous solid waste clarifier sludge, cooling tower sludge, and steckle dust all generated from NUCOR Steel Tuscaloosa, Inc. as an alternate daily cover. The clarifier sludge, cooling tower sludge, and steckle dust may only be used to cover interior slopes of the cells. All exterior slopes shall be covered with soil in accordance with the approved plans and permit. A minimum of six inches of clarifier sludge, cooling tower sludge, or steckle dust shall be applied as cover. The Permittee shall be required to cover the active cell with six inches of earthen cover at the conclusion of each week' s activities. The variance was granted by ADEM on 11/25/14.

7. Siting requests and approvals relevant to current operations.

Siting request and approvals relevant to current operations are contained within the information provided as part of the Permit Application package accompanying the current design drawings and Operations Manual titled “Permit Plans - Phase 4, Black Warrior Solid Waste Facility, Rev. January 2013”. The current Operations Manual (including approvals) are those submitted

concurrently with the Permit Plans and approved in the Facility's permit issued on 11/20/2013.

8. Hydrogeological evaluations relevant to current operations.

The hydro-geologic evaluation relevant to current operations is contained within the information provided as part of the Permit Application package accompanying the current design drawings and Operations Manual titled "Permit Plans - Phase 4, Black Warrior Solid Waste Facility, Rev. January 2013".

The Hydro-geologic Evaluation is performed in accordance with current ADEM Division 13 regulations and is described in Section 3 and 4 of the Operations Manual (Operations Manual, Vol I, pages 10-9 through 10-11) including the May 4, 2012 Supplement submitted within the Permit Application package.

Sincerely,
CDG, Inc.

R. Daniel Wells, PE
Principal Engineer

Enc.
May 6, 2013 Host Government Approval for Expansion

ORDINANCE NO. 1809
ORDINANCE GRANTING HOST GOVERNMENT APPROVAL FOR A PROPOSED EXPANSION OF THE BLACK WARRIOR SOLID WASTE DISPOSAL FACILITY

WHEREAS, the City of Northport, having received the application for local government approval from the Black Warrior Solid Waste Disposal Authority for a proposed major modification of its permit for its municipal solid waste disposal facility pursuant to the Alabama Solid Waste Disposal Act, Section 22-27-48 of the Code of Alabama (1975), as amended; and

WHEREAS, the Black Warrior Solid Waste Disposal Authority has proposed an expansion of its Black Warrior Solid Waste Disposal Facility from the existing 226.48 acres to 432.41 acres. The facility lies within Sections 2 and 11, Township 21 South, Range 11, and is located in the City of Northport, Tuscaloosa County, and

WHEREAS, the service area for the facility will remain the State of Alabama; and

WHEREAS, the maximum average daily volume will remain 1,500 tons per day, and

WHEREAS, the City of Northport did publish a NOTICE OF HEARING TO ACCEPT PUBLIC COMMENT CONCERNING APPROVAL OF A PROPOSED LANDFILL EXPANSION, and said notice was published at least 30 days prior to the hearing, and said notice was published in the Northport Gazette on the 3rd day of April, 2013; and

WHEREAS, in determining whether to recommend local approval of the proposed modification of the permit for the Landfill Expansion, the City of Northport has carefully considered each of the following issues related to the proposal and found them consistent with the relevant provisions of state law:

1. The consistency of the proposal with the County's solid waste management need as identified in its plan;

2. The relationship of the proposal to local planned or existing development or the absence thereof, to major transportation arteries and to existing state primary and secondary roads;

3. The location of the facility in relationship to existing industries that generate large volumes of solid waste, or the relationship to the areas projected for development of industries that will generate solid waste;

4. Costs and availability of public services, facilities and improvements required to support a proposed facility and protect public health, safety and the environment;

5. The impact of the proposed expansion on public safety and provisions made to minimize the impact on public health and safety; and

6. The social and economic impacts of the proposed expansion on the affected community, including changes in property values, and social or community perception.

THEREFORE, BE IT ORDAINED that the City Council for the City of Northport hereby finds the application by the Black Warrior Solid Waste Disposal Authority for its proposed major modification of the permit for its municipal solid waste disposal facility is consistent with the Alabama Solid Waste Disposal Act, Section 22-27-48 of the Code of Alabama (1975), as amended, and hereby approves the proposed application for a major modification of its permit for the Black Warrior Solid Waste Disposal Facility Expansion.

This Ordinance shall become effective immediately upon its passage and advertisement as required by law.

Adopted by the City Council of the City of Northport in a public meeting this 6th day of May, 2013.

The Northport Gazette
05/08/2013