

**BASF Corporation
McIntosh, Alabama
EPA I.D. Number ALD 001 221 902**

FACT SHEET

A draft modification to the Alabama Hazardous Waste Management and Minimization Act (AHWMMA) permit has been prepared for the BASF Corporation facility. This hazardous waste facility is located in McIntosh, Alabama. This fact sheet has been prepared to briefly advise the public of the principal permitting, legal and policy issues of the draft permit.

I. PERMIT PROCESS

The purpose of the permitting process is to allow the State and the public to evaluate BASF's ability to comply with the hazardous waste management requirements of the AHWMMA, as amended. BASF must comply with hazardous waste management conditions set forth in the permit during the effective period of the permit, which is ten (10) years from the last permit renewal (December 21, 2023).

II. PROCEDURES FOR REACHING A FINAL DECISION

The Alabama Department of Environmental Management (ADEM or Department) is proposing to issue BASF a permit modification for the operating permit.

ADEM Admin. Code r. 335-14-8-.08(6)(b)1. requires that the public be given at least a 45-day comment period for each draft permit. The comment period will begin April 24, 2026, which is the date of publication of the public notice in major local newspaper(s) of general circulation, and will end on June 8, 2026. The public notice will also be broadcast over local radio station(s).

Any person interested in commenting on the application or draft permit must do so within the 45-day comment period discussed above.

All persons wishing to comment on any of the permit conditions or the permit application should submit their comments in writing to the Alabama Department of Environmental Management, Permits and Services Division, 1400 Coliseum Blvd. (36110-2059), P.O. Box 301463 (36130-1463) Montgomery, Alabama, ATTENTION: Mr. Russell A. Kelly.

ADEM will consider all written comments received during the comment period while making a permit decision for this facility. When the Department makes its final permit decision, notice will be given to the applicant and each person who has submitted written comments or requested notice of the final permit decision.

III. FACILITY DESCRIPTION

BASF, formerly known as Ciba Specialty Chemicals, occupies approximately 1500 acres within an industrial park along the Tombigbee River. BASF manufactures additives used in plastics and lubricants.

To manage hazardous waste generated by their manufacturing processes, BASF operates an on-site treatment, storage, and disposal (TSD) facility. This facility consists of a hazardous waste above ground landvault and a hazardous waste fueled boiler. Approved on-site hazardous waste residuals as well as other on-site solid waste are transported by truck from process areas to the TSD. In order to operate a TSD facility, an AHWMMMA operating permit is required.

The AHWMMMA operating permit sets operating parameters in accordance with the ADEM Administrative Code to ensure the safe operation of the facility. The permit for this facility addresses the on-site hazardous waste disposal in the landvault and treatment in the boiler. Post-closure care for 7 closed landfill or surface impoundments addressing cover/cap maintenance and a leachate management system are included. A groundwater monitoring and corrective action program is also included to address groundwater contamination associated with the past operations of the closed units. The program currently includes a pump and treat system for the alluvial aquifer and an enhanced source control component for the Miocene aquifer.

IV. SUMMARY OF PROPOSED MODIFICATIONS

The proposed modification includes adding three additional Recovery wells (PW-11S, PW-12, and PW-13) and resuming the operation of one additional Recovery well (PW-5). There will also be 3 to 5 new monitoring wells added to the existing network for the Miocene clay sand lens. This modification will increase the recovery and monitoring of groundwater contamination

V. CHANGES TO THE EXISTING PERMIT

The specific changes to the permit are explained below.

<u>Section/Appendix</u>	<u>Reason</u>
Permit Cover Page	Updated major modification date
Permit Signature Page	Updated major modification date
Permit Table of Contents	Updated major modification date and reference to work plan
Part IX.B.1.e.	Permit condition added due to new wells being installed
Part IX.E.1.b. and Part IX.E.1.c.	New Miocene clay sand lens wells and recovery wells PW-5, PW-11S, PW-12, and PW-13 were listed in the narrative of these sections.
Table IX.1	New Miocene clay sand lens wells and recovery wells PW-5, PW-11S, PW-12, and PW-13 were added to the table

VI. TECHNICAL CONTACT

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Engineering Services Section
Industrial Hazardous Waste Branch, Land Division
Alabama Department of Environmental Management
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P.O. Box 301463 (36130-1463)
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HAZARDOUS WASTE FACILITY PERMIT

PERMITTEE: BASF Corporation

ADDRESS: 1379 Ciba Road
McIntosh, AL 36553

EPA ID/PERMIT NUMBER: ALD 001 221 902

UNITS PERMITTED: Storage in Tanks
Treatment in Boiler
Disposal in Landvault
Post-Closure Care

ISSUANCE DATE: December 21, 2023
XX Modification 1 – Major

EFFECTIVE DATE: December 21, 2023

EXPIRATION DATE: December 20, 2033

This Permit is issued pursuant with the Code of Alabama 1975, §§ 22-30-1-et. seq., as amended, and regulations adopted thereunder and the Hazardous Wastes Management and Minimization Act and in accordance with the plans and specifications and applications filed with the Department subject to the conditions appended hereto, all of which are considered a part of this Permit. This Permit shall be subject to all applicable laws of the State of Alabama, rules and regulations and orders of the Department of Environmental Management and shall be effective from the date of issuance.

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
HAZARDOUS WASTE PERMIT

Permittee:

Permit Number:

ALD 001 221 902

Identification Number:

ALD 001 221 902

OWNER:

BASF Corporation

100 Campus Drive

Florham Park, New Jersey 07932

Morris County

OPERATOR:

BASF Corporation

1379 Ciba Road

McIntosh, Alabama 36553

Pursuant to the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA), Code of Alabama 1975, Section 22-30-1, et. seq., as amended, and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM or the Department), a permit is issued to BASF Corporation for the facility located in McIntosh, Alabama, at latitude N 31° 16' 37" and longitude W 88° 00' 16".

The Permittee must comply with all terms and conditions of this permit, which consists of the conditions set forth herein (including those in any attachments), and the regulations applicable to the Permittee's facility contained in Chapters 335-14-1, 335-14-2, 335-14-5, 335-14-8, and 335-14-9 of the ADEM Administrative Code of Regulations (hereinafter referred to as the "ADEM Admin. Code Rule"). Applicable regulations are those which are in effect on the date of issuance of this permit.

This permit is based on the assumption that the information submitted in the permit application attached to the Permittee's letter dated November 10, 2021, as modified by subsequent amendments dated September 1, 2022, March 21, 2023, and August 8, 2023 (hereby incorporated by reference and hereafter referred to as the Application) is accurate and that the facility will be constructed and operated as specified in the Application. Any inaccuracies found in this information could lead to the termination or modification of this permit in accordance with ADEM Admin. Code Rules 335-14-8-.04(2), 335-14-8-.04(3), and 335-14-8-.04(4) and could lead to potential enforcement action. The Permittee must inform ADEM of any deviation from or changes in the information provided in the Application that would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

This permit is effective as of December 21, 2023, as modified on XX, and shall remain in effect until December 20, 2033, unless revoked and reissued, or terminated under ADEM Admin. Code Rules 335-14-8-.04(2) and 335-14-8-.04(4) or continued in accordance with ADEM Admin. Code Rule 335-14-8-.05(2).

Alabama Department of Environmental Management

Date Signed

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Documents Incorporated By Reference:

Part A and Part B Permit Application submitted on November 10, 2021, as modified by subsequent amendments dated September 1, 2022, March 21, 2023, and August 8, 2023.

Permit Modification Request - Work Plan for Additional Alluvial Aquifer Extraction Wells (Bluffline & Upland Areas), dated January 31, 2025.

Remediation Plan – Former Production Areas 7 and 8, dated October 2015, as modified by subsequent amendments dated January 29, 2016.

Environmental Covenant for OU-3 Sand Cover, dated January 7, 2016.

Environmental Covenant for Groundwater under Parcels A and A-1, dated April 18, 2016.

The following CERCLA documents are incorporated to serve as documentation of the Corrective Measures Implementation plan for the site:

OU-1: Remedial Investigation/Feasibility Study (RI/FS) and Remedial Design (RD), OU-1 dated September 1989; Record of Decision (ROD), dated September 28, 1989.

OU-2: RI/FS, dated September 1991; ROD, dated September 30, 1991; RD, dated September 1996.

OU-3: RI/FS, dated August 1988; ROD, dated July 25, 1995; Final RI Addendum Report, dated July 1994; RD, dated October 1997: Explanation of Significant Differences (ESD), dated June 5, 2019; Amended ROD, dated August 9, 2024.

OU-4: RI/FS, dated July 1992; ROD, dated July 14, 1992; RD OU-4 dated September 1996.

PART I

STANDARD FACILITY CONDITIONS

I.A. EFFECT OF PERMIT

Issuance of this permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under the AHWMMMA, or any other law governing the protection of public health or the environment, for any imminent and substantial endangerment to human health, welfare, or the environment. (ADEM Admin. Code Rule 335-14-8-.01(4)).

I.B. SEVERABILITY

The provisions of this permit are severable and if any provision of this permit, or the application of any 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.

I.C. DUTIES AND REQUIREMENTS

1. Duty to Comply

The Permittee shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit. Any permit noncompliance, other than noncompliance authorized by an emergency permit, constitutes a violation of the AHWMMMA, and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

2. Duty to Reapply

a. Operating Units

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 application for a new permit must be submitted at least 180 calendar days before the expiration of this permit, as required by ADEM Admin. Code Rule 335-14-8-.03(1)(b)2.

b. SWMU Corrective Action Requirements

The Permittee must submit an application for a new permit for both post-closure and Solid Waste Management Unit (SWMU) corrective measures at least 180 calendar days before the expiration of this permit. The Permittee must reapply in order to fulfill the 30-year post-closure care period required by ADEM Admin. Code Rule 335-14-5-.07(8)(a)1. The Department may shorten or extend the post-closure care period applicable to the hazardous waste facility in accordance with ADEM Admin. Code Rules 335-14-5-.07(8)(a)2. and 335-14-8-.03(1)(b).

3. 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 in order to maintain compliance with the conditions of this permit.

4. 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.

5. Proper Operation and Maintenance

The Permittee shall, at all times, properly operate and maintain all facilities and systems of treatment, monitoring, and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance (O&M) includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause as specified in ADEM Admin. Code Rules 335-14-8-.04(2), 335-14-8-.04(3), and 335-14-8-.04(4). The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay any permit condition.

7. Property Rights

Issuance of this permit does not convey any property rights of any sort, nor any exclusive privilege.

8. Duty to Provide Information

The Permittee shall furnish to the Department, within a reasonable time as determined by the Department, any relevant information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

9. Inspection and Entry

The Permittee shall allow duly designated officers and employees of the Department, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter at reasonable times upon the Permittee's premises where a 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, any records that must be kept under the conditions of this permit;
- c. Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,
- d. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the AHWMMMA, any substances or parameters at any location. The Permittee shall have the opportunity to split samples during sampling.

10. Monitoring and Records

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from ADEM Admin. Code Rule 335-14-2-Appendix I, or the methods specified in Waste Analysis Plan (WAP) Appendix B of the permit application. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846 (latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Standard Methods for the Examination of Water and Wastewater (latest edition), the methods specified in Appendix B of the permit application, or an alternative method approved by ADEM. [ADEM Admin. Code Rule 335-14-8-.03(1)(j)1.]
- b. The Permittee shall maintain, at the facility, records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, the certification required by ADEM Admin. Code Rule 335-14-5-.05(4)(b)9, records of all data used to prepare documents required by this permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the certification, application, sample, measurement, report or record, or until corrective action is completed, whichever date is later. This period may be extended by the Department at any time and is automatically extended during the course of any unresolved enforcement action regarding this facility. [ADEM Admin. Code Rules 335-14-5-.05(5)(b) and 335-14-8-.03(1)(j)2.]
- c. The Permittee shall maintain, at the facility, records of all groundwater monitoring wells, piezometers, and associated groundwater surface elevations throughout the term of this permit. These records shall include the surveyed location, surveyed elevation, surveyed elevation reference point, total depth, screened interval, construction details, well log, and all other pertinent information for each well and piezometer.

- d. Records for monitoring information shall include:
 - i. The date(s), exact place, and times of sampling or measurements;
 - ii. The names of individual(s) who performed the sampling or measurements;
 - iii. The date(s) analyses were performed;
 - iv. The names of individual(s) who performed the analyses;
 - v. The analytical techniques or methods used; and,
 - vi. The results of such analyses.
- e. The following documents and information shall be maintained throughout the term of this permit at the Facility:
 - i. Complete copy of this permit and the permit application.
 - ii. Operating record as required by ADEM Admin. Code Rule 335-14-5-.05(4) and this permit.
 - iii. Copies of all plans, reports, inspection schedules, and inspection logs as required by ADEM Admin. Code Chapter 335-14-5 and this permit.

11. Signatory Requirements

All applications, reports or information required by this permit and submitted to the Department shall be signed and certified in accordance with ADEM Admin. Code Rules 335-14-8-.02(2) and 335-14-8-.03(1)(k).

12. Reporting Requirements

a. Planned Changes

The Permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility and any solid waste management units identified under Part VII of this permit.

b. Anticipated Noncompliance

The Permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

c. Transfer of Permits

This permit may be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to ADEM Admin. Code Rules 335-14-8-.04(1)

or 335-14-8-.04(3)(a)1.(vii). Before transferring ownership or operation of the facility during the term of this permit, the Permittee shall notify the new owner or operator, in writing, of the requirements of ADEM Admin. Code Chapters 335-14-5 and 335-14-8 and this permit.

d. Monitoring Reports

Monitoring results shall be reported at the intervals specified elsewhere in this permit.

e. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Department no later than 14 calendar days following each schedule date.

f. Twenty-Four Hour Reporting

i. The Permittee shall report to the Department any noncompliance with this permit that may endanger human health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. This report shall include, but is not limited to, the following:

- (I) Information concerning the release of any hazardous waste which may endanger public drinking water supplies; and,
- (II) Information concerning the release or discharge of any hazardous waste, or hazardous waste constituents, or of a fire or explosion at the facility, which could threaten the environment or human health outside the facility.

ii. The description of the occurrence and its cause shall include:

- (I) Name, address, and telephone number of the owner or operator;
- (II) Name, address, telephone number, and EPA Identification Number of the facility;
- (III) Date, time, and type of incident;
- (IV) Name and quantity of material(s) involved;
- (V) The extent of injuries, if any;
- (VI) An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and,

(VII) Estimated quantity and disposition of recovered material that resulted from the accident.

iii. A written submission shall also be provided within 5 calendar days of the time that the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance (including exact dates and times); whether the noncompliance has been corrected, and if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

g. Other Noncompliance

The Permittee shall report to the Department all instances of noncompliance not otherwise required by Permit Conditions I.C.12.d., I.C.12.e., or I.C.12.f. at the time any other reports required by this permit are submitted. The reports shall contain the information required by Permit Condition I.C.12.f.

h. Other Information

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to the Department any information related to compliance with this permit.

13. Certification of Construction

The Permittee may not commence treatment, storage or disposal of hazardous waste or contaminated media at any new or modified portion of the facility until the Permittee has submitted to the Department, by certified mail or hand-delivery, a letter (together with the certification by the Construction Quality Assurance (CQA) officer required by ADEM Admin. Code Rule 335-14-5-.02(10)(d) and any other certifications required by this permit or ADEM Admin. Code Division 335-14 signed by the Permittee and an Alabama-registered Professional Engineer stating that the facility has been constructed or modified in compliance with this permit where appropriate; and,

- a. The Department has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of this permit; [ADEM Admin. Code Rule 335-14-8-.03(1)(1)2(ii)(I).] or
- b. The Department has either waived the inspection or has not notified the Permittee, within 15 calendar days of the notification from the Permittee, of its intent to inspect. [ADEM Admin. Code Rule 335-14-8-.03(1)(1)2(ii)(II)]

14. The Permittee shall assure that all measures necessary to maintain and/or achieve compliance with all applicable requirements of ADEM Admin. Code Division 335-14 are taken during the active life of the facility, post-closure care period, corrective action period, and throughout the term of this permit.

15. If circumstances beyond the Permittee's control arise to prevent achievement of any deadline set forth by this permit, the Permittee may immediately, upon the occurrence thereof, request an extension by sending a written request to the Department explaining the need for the extension. The Department may, after consideration of the circumstances, grant the extension. Requests for extensions may require a permit modification pursuant to ADEM Admin. Code Rule 335-14-8-.04(2) or (3).

I.D. CONFIDENTIAL INFORMATION

The Permittee may claim confidential any information required to be submitted by this permit if the information is protected under the Code of Alabama 1975, §22-30-18, as amended. The term “trade secret” as used in §22-30-18 is defined in the Code of Alabama 1975, §22-30-2(12).

I.E. DEFINITIONS

For the purposes of this permit, terms used herein shall have the same meaning as those in ADEM Admin. Code Chapters 335-14-1, 335-14-2, 335-14-5, and 335-14-8, unless this permit specifically provides otherwise. Where terms are not defined in the regulations or this permit, a standard dictionary reference or the generally accepted scientific or industrial meaning of the term shall define the meaning associated with such terms.

“Area of concern” (AOC), for the purposes of this permit, includes any area having a probable release of a hazardous waste or hazardous constituent which is not from a solid waste management unit and is determined by the Department to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required under Section 3005(c)(3) of the Resource Conservation and Recovery Act and ADEM Admin. Code Rule 335-14-8-.03(3)(b)2. to ensure adequate protection of human health and the environment.

“Contamination”, for the purposes of this permit, refers to the presence of any hazardous constituent in a concentration that exceeds the naturally occurring concentration of that constituent in the immediate vicinity of the facility (i.e., areas not affected by the facility).

“Corrective action”, for the purposes of this permit, is the sum of all corrective measures necessary to protect human health and the environment for all releases of hazardous constituents from any SWMU at the facility, regardless of the time at which waste was placed in the unit, as required by ADEM Admin. Code Rules 335-14-5-.06(11) and/or 335-14-5-.06(12). Corrective measures may address releases to air, soils, surface water, or groundwater.

“Corrective measures”, for the purposes of this permit, include all individual measures taken and/or necessary to remedy releases and to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any SWMU at the facility, regardless of the time at which waste was placed in the unit, as required under ADEM Admin. Code Rule 335-14-5-.06(12). Corrective measures may address releases to air, soils, surface water, or groundwater. The sum of all individual corrective measures is known as corrective action.

“Extent of contamination”, for the purposes of this permit, is defined as the horizontal and vertical areas in which the concentrations of hazardous constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Department.

“Groundwater Protection Standard”, for the purposes of this permit, refers to a groundwater concentration limit which is established pursuant to ADEM Admin. Code Rule 335-14-5-.06(3).

“Hazardous constituents”, for the purposes of this permit, are those substances listed in ADEM Admin. Code Rule 335-14-2-Appendix VIII and/or ADEM Admin. Code Rule 335-14-5-Appendix IX and include hazardous constituents released from solid waste, hazardous waste, and hazardous waste constituents that are reaction by-products.

“Interim measures”, for the purposes of this permit, are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long term corrective action remedies are evaluated and, if necessary, implemented.

“Land Disposal”, for the purposes of this permit, and ADEM Admin. Code Chapter 335-14-9 means placement in or on the land and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.

“Landfill”, for the purposes of this permit, includes any disposal facility or part of a facility where hazardous waste is placed in or on the land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

“Land Use Controls”, for the purposes of this permit, is as defined by ADEM Admin. Code Rule 335-15-1-.02.

“Method detection limit” (MDL), for the purposes of this permit, means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

“Mixed waste”, for the purposes of this permit, means a solid waste that is a mixture of hazardous waste (as defined in ADEM Admin. Code Rule 335-14-2-.01(3)) and radioactive waste (as defined in 10 CFR 61.2). The radioactive component of mixed waste is subject to regulation by the Atomic Energy Act (AEA)/Nuclear Regulatory Commission (NRC). The non-radioactive chemically hazardous component of mixed waste is subject to regulation by the AHWMA and ADEM Admin. Code Division 335-14.

“Miscellaneous unit”, for the purposes of this permit, means a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under 40 CFR Part 146, containment building, corrective action management unit, unit eligible for a research, development and demonstration permit under ADEM Admin. Code Rule 335-14-8-.06(4); or staging pile.

“Non-regulated waste”, for the purposes of this permit, means waste that is not otherwise regulated as RCRA listed and/or characteristic hazardous waste. In this case, non-regulated includes, but it not limited to, solid and universal waste, used oil, PCB, etc. Universal waste and used oil are subject to ADEM Admin. Code Chapter 335-14-11, Standards for Universal Waste

Management and ADEM Admin. Code Chapter 335-14-17, Standards for the Management of Used Oil, respectively.

“Operating day”, for the purposes of this permit, means any day on which hazardous waste is treated, stored, or disposed of in a unit. For example, each day that a hazardous waste storage unit contains hazardous waste is an operating day, as is each day that a disposal unit contains or receives hazardous waste, or each day that hazardous waste is treated in a treatment unit.

“Practical quantitation limits” (PQL), for the purposes of this permit, are the lowest concentrations of analytes in groundwater that can be reliably determined within specified limits of precision and accuracy by a given method under routine laboratory operating conditions, as listed in ADEM Admin. Code Rule 335-14-5-Appendix IX.

“Release”, for the purposes of this permit, includes any spilling, leaking, pouring, emitting, emptying, discharging, injecting, escaping, leaching, pumping, or disposing into the environment of any hazardous waste or hazardous constituent.

“Remediation waste” for the purpose of this permit includes all SWMUs and all media (including groundwater, surface water, soils, and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements under ADEM Admin. Code Rule 335-14-5-.06(12) and RCRA Section 3008(h). For a given facility, remediation wastes may originate only from within the facility boundary, but may include waste managed in implementing RCRA Sections 3004(v) or 3008(h) for releases beyond the facility boundary.

“Solid waste”, for the purposes of this permit, means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining, and agricultural operations, and from community activities. It does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

"Solid waste management unit" (SWMU), for the purposes of this permit, includes any unit that has been used for the treatment, storage or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. RCRA-regulated hazardous waste management units are also solid waste management units. SWMUs include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (*e.g.*, product or process spills).

“Storm event”, for the purposes of this permit, is defined as a 1-year, 24-hour storm event or rainfall that measures 1 inch or greater in 1 hour or less. Rainfall measurements may be taken at the site, or the closest official weather monitoring station may be used.

“Temporary Unit” (TU), for the purposes of this permit, includes any temporary tanks and/or container storage areas used solely for treatment or storage of hazardous remediation wastes during specific remediation activities. Designated by the Department, such units must conform to specific standards and may only be in operation for a period of time as specified in this permit.

“Unit”, for the purposes of this permit, includes any contiguous discernable area used for the management of hazardous waste (or non-hazardous waste in the case of a SWMU) and may include, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, wastewater treatment unit, elementary neutralization unit, transfer station, recycling unit or the OB and OD units.

I.F. EXPIRATION AND CONTINUATION OF PERMIT

This permit and all conditions herein will remain in effect beyond this permit's expiration date if the Permittee has submitted a new application as required by Permit Condition I.C.2. and, through no fault of the Permittee, the Department has not issued a new permit (ADEM Admin. Code Rules 335-14-8-.05(1) and 335-14-8-.05(2)).

I.G. WASTE MINIMIZATION

1. Certification Requirements

Pursuant to ADEM Admin. Code Rule 335-14-5-.05(4)(b)9, the Permittee must certify, no less often than annually, that:

- a. The Permittee has a program in place to reduce the volume and toxicity of hazardous waste to the degree determined by the Permittee to be economically practicable; and,
- b. The proposed method of treatment, storage, or disposal is the most practicable method available to the Permittee and that it minimizes the present and future threat to human health and the environment.

2. Recording Requirements

- a. The Permittee shall maintain copies of this certification in the facility operating record as required by ADEM Admin. Code Rule 335-14-5-.05(4)(b)9.
- b. The Waste minimization Program required under I.G.1. should at a minimum address the following topics:
 - i. Identity of each hazardous waste stream and the source of generation.
 - ii. Types and amount of hazardous waste that is generated at the facility.
 - iii. Present and proposed method of treatment, storage, or disposal that is available to the Permittee.
 - iv. Description of techniques implemented in the past for hazardous waste reduction and their effectiveness.
 - v. An evaluation of technically and economically feasible hazardous waste reduction techniques.

- vi. A program and schedule for implementing the selected hazardous waste reduction technique.

I.H. COST ESTIMATES

1. The Permittee shall maintain detailed written cost estimates, in current dollars, at the location specified in Permit Condition I.C.10.e. and on file with ADEM in accordance with ADEM Admin. Code Rules 335-14-5-.08(3), 335-14-5-.08(5), and 335-14-5-.08(10).
2. All cost estimates must be updated annually as required by ADEM Admin. Code Rules 335-14-5-.08(3)(b), 335-14-5-.08(5)(b), and 335-14-5-.08(10)(b).
3. The cost estimate shall be maintained and submitted in the form designated by the Department.
4. The Permittee must update the cost estimate no later than 30 calendar days after the Department has approved a modification to the Closure Plan, Post-Closure Plan, or Corrective Action Plan, or any other plan required or referenced by this permit, if the change in the plan results in an increase in the amount of the cost estimate.

I.I. FINANCIAL ASSURANCE

1. The Permittee shall demonstrate continuous compliance with ADEM Admin. Code Rule 335-14-5-.08 by providing documentation of financial assurance in at least the amount that equals or exceeds the cost estimate. Changes in financial assurance mechanisms must be approved by the Department.
2. The Permittee shall submit itemized statements for all capital expenditures and a complete, revised cost estimate to the Department when requesting approval for a reduction in the financial assurance mechanism.

I.J. PERMIT MODIFICATIONS

The Permittee shall request a permit modification whenever changes in operating plans or facility design affect any plan (*e.g.* groundwater monitoring, closure, post-closure, or corrective action) required or referenced by this permit. The Permittee must submit a written request for a permit modification, pursuant to the requirements of ADEM Admin. Code Rule 335-14-8-.04(2), at least 60 calendar days prior to the proposed change in facility design or operation.

I.K. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DEPARTMENT

One hard copy and one electronic (an optical character recognition or text-searchable) copy of all reports, notifications, or other submissions that are required by this permit should be sent via certified mail or given to:

Chief, Land Division
Alabama Department of Environmental Management
P.O. Box 301463 (Zip 36130-1463)
1400 Coliseum Boulevard (Zip 36110-2059)
Montgomery, Alabama

and

Director, RCRA Division
USEPA Region 4
Atlanta Federal Center
61 Forsyth Street SW
Atlanta, Georgia 30303-3104

PART II

GENERAL FACILITY CONDITIONS

II.A. GENERAL WASTE ANALYSIS

1. The Permittee shall comply with all requirements set forth under ADEM Admin. Code Rule 335-14-5-.02(4) and shall follow the procedures in the WAP described in Appendix B of the permit application.
2. The Permittee shall utilize the methods specified in Appendix B of the permit application for the analysis of any of the wastes listed in Appendix B of the permit application. Modification of the WAP shall require a modification of this permit pursuant to ADEM Admin. Code Rule 335-14-8-.04(2).
3. The Permittee shall subject samples from incoming waste shipments to the fingerprint parameters identified in Appendix B of the permit application.
4. The Permittee shall classify waste as non-conforming when the receiving analysis does not match the information contained in the accompanying manifest, profile, and/or equivalent information described in Appendix B of the permit application.
5. Before storing, treating, or disposing of a hazardous waste stream, the Permittee shall obtain a detailed chemical and physical analysis of a representative sample of the waste, as described in Appendix B of the permit application.

II.B. SECURITY

1. The Permittee shall comply with the security provisions set forth under ADEM Admin. Code Rule 335-14-5-.02(5) and as described in Appendix C of the permit application.
2. In order to comply with ADEM Admin. Code Rule 335-14-5-.02(5), the hazardous waste storage areas of the facility shall remain fenced with at least a six-foot high chain link fence. The fence shall be kept in good condition. All entrances to the permitted hazardous waste management areas shall be closed and locked when security and/or operations personnel are not present.
3. The Permittee shall maintain signs along the perimeter fence of the permitted hazardous waste management areas. The signs shall read "Danger – Unauthorized Personnel Keep Out". At least one sign must be legible from a distance of at least 25 feet from any approach to each area (ADEM Admin. Code Rule 335-14-5-.02(5)(c)).

II.C. GENERAL INSPECTION REQUIREMENTS

1. The Permittee shall comply with all requirements of ADEM Admin. Code Rules 335-14-5-.02(6) and 335-14-5-.09(5),
2. The Permittee shall follow the inspection procedures and schedules, as described in Appendix D of the permit application.
3. The Permittee shall remedy any deterioration or malfunction (of equipment or structure(s)) discovered during any inspection as required by ADEM Admin. Code Rule 335-14-5-.02(6).

4. Records of inspections shall be maintained at the facility as required by ADEM Admin. Code Rule 335-14-5-.02(6).

II.D. PERSONNEL TRAINING

The Permittee shall conduct personnel training as required by ADEM Admin. Code Rule 335-14-5-.02(7). This training program shall follow the procedures and outline, described in Appendix E of the permit application. The Permittee shall maintain training documents and records at the facility as required by ADEM Admin. Code Rule 335-14-5-.02(7)(d) and (e).

II.E. GENERAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

1. The Permittee shall comply with all requirements for ignitable, reactive, or incompatible wastes set forth under ADEM Admin. Code Rule 335-14-5-.02(8).
2. “No Smoking” signs must be conspicuously placed wherever there is a potential hazard from ignitable waste.

II.F. LOCATION STANDARDS AND UNIT MAINTENANCE

1. The Permittee shall comply with all locations standards set forth under ADEM Admin. Code Rule 335-14-5-.02(9).
2. If changes are made to the design or operation of a hazardous waste management or treatment unit, these changes must receive approval by the Department before they are implemented, and may require permit modification pursuant to ADEM Admin. Code Rule 335-14-8-.04(2).

II.G. PREPAREDNESS AND PREVENTION

1. Required Equipment

The Permittee shall comply with ADEM Admin. Code Rule 335-14-5-.03(3) and, at a minimum, shall equip the facility with the equipment set forth in the Contingency Plan, Appendix F of the permit application.

2. Testing and Maintenance of Equipment

The Permittee shall test and maintain the equipment specified in the Contingency Plan, Appendix F of the permit application, as necessary to assure its proper operation in time of emergency as required by ADEM Admin. Code Rule 335-14-5-.03(4).

3. Access to Communication or Alarm System

The Permittee shall maintain access to the communications or alarm system as required by ADEM Admin. Code Rule 335-14-5-.03(5).

4. Arrangements with Local Authorities

The Permittee shall maintain arrangements with state and local authorities as required by ADEM Admin. Code Rule 335-14-5-.03(8). The Permittee shall develop and maintain a

Preparedness and Prevention Plan providing information on the type, approximate quantities and locations of hazardous wastes within the facility. The Plan shall be provided to state and local authorities in both written paper format and in appropriate electronic format that is most useful to emergency responders. Updated copies of the Plan shall be provided to reflect significant changes in operations (*e.g.*, significant changes in waste streams and/or volumes, facility design changes, etc.). A copy of the Plan and documentation that the Plan has been submitted to all local police departments, fire departments, hospitals and local emergency response teams that may be called upon to provide emergency services, shall be submitted to the Department within 45 calendar days from the effective date of this permit. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

5. Required Aisle Space

The Permittee shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency (ADEM Admin. Code Rule 335-14-5-.03(6)).

II.H. CONTINGENCY PLAN

1. Implementation of Plan

The Permittee shall immediately carry out the provisions of the Contingency Plan, Appendix F of the permit application) and follow the emergency procedures as required by ADEM Admin. Code Rule 335-14-5-.04(2) whenever there is a fire, explosion, or release of hazardous waste or hazardous constituents which threatens or could threaten human health or the environment.

2. Copies of Plan

A copy of the Contingency Plan and all current revisions to the plan must be maintained at the facility and submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services, as described in Appendix F of the permit application, and as required by ADEM Admin. Code Rule 335-14-5-.04(4).

3. Amendments to Plan

The Permittee shall review and immediately amend, if necessary, the Contingency Plan, as required by ADEM Admin. Code Rule 335-14-5-.04(5).

4. Emergency Coordination

The Permittee shall comply with the requirements of ADEM Admin. Code Rule 335-14-5-.04(6) concerning the emergency coordinator as specified in the Contingency Plan, Appendix F of the permit application).

II.I. RECORDKEEPING AND REPORTING

1. Operating Record

The Permittee shall maintain a written operating record at the facility in accordance with ADEM Admin. Code Rule 335-14-5-.05(4).

2. Availability, Retention, and Disposition of Records

The Permittee shall comply with the Availability, Retention, and Disposition of Records at the facility in accordance with ADEM Admin. Code Rule 335-14-5-.05(5).

3. Biennial Report

The Permittee shall comply with the biennial report requirements of ADEM Admin. Code Rule 335-14-5-.05(6).

II.J. CLOSURE

1. Performance Standard

The Permittee shall close the permitted hazardous waste management areas, as required by ADEM Admin. Code Rules 335-14-5-.07(2), 335-14-5-.09(9), 335-14-5-.10(8), and in accordance with the Closure Plan, Appendix J of the permit application.

2. Amendment to Closure Plan

The Permittee shall amend the Closure Plan as required by ADEM Admin. Code Rule 335-14-5-.07(3)(c).

3. Notification of Closure

As required by ADEM Admin. Code Rule 335-14-5-.07(3)(d), the Permittee shall notify the Department at least 60 calendar days prior to the date closure activities are initiated at either unit.

4. Time Allowed for Closure

The Permittee shall comply with the requirements of ADEM Admin. Code Rule 335-14-5-.07(4). After receiving or treating the final volume of hazardous waste, the Permittee shall complete closure activities in accordance with the schedule specified in the Closure Plan, Appendix J of the permit application.

5. Disposal or Decontamination of Equipment, Structures, and Soils

The Permittee shall decontaminate or properly dispose of all facility equipment, structures, and soils as required by ADEM Admin. Code Rules 335-14-5-.07(5), unless otherwise specified in ADEM Admin. Code Rules 335-14-5-.09(9), 335-14-5-.10(8), 335-14-5-.11(9), 335-14-5-.12(9), 335-14-5-.13(11), 335-14-5-.14(11), 335-14-5-.19(1) through (3), 335-14-5-.23(6), 335-14-5-.24, or 335-14-5-.30(3) and as specified in the Closure Plan, Appendix J of the permit application.

6. Certification of Closure

The Permittee shall certify that each individual unit has been closed in accordance with the specification presented in the Closure Plan, Appendix J of the permit application, and

as required by ADEM Admin. Code Rule 335-14-5-.07(6). The Permittee shall maintain copies of this closure certification in the facility operating record as required by ADEM Admin. Code Rule 335-14-5-.05(4).

II.K. POST-CLOSURE (Reserved – See Part VI of the Permit)

II.L. LAND DISPOSAL RESTRICTIONS

1. General Restrictions

ADEM Admin. Code Chapter 335-14-9 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances in which an otherwise prohibited waste may continue to be placed on or in a land treatment, storage or disposal unit. The Permittee shall maintain compliance with the requirements of ADEM Admin. Code Chapter 335-14-9. Where the Permittee has applied for an extension, waiver, or variance under ADEM Admin. Code Chapter 335-14-9 the Permittee shall comply with all restrictions on land disposal under this Part once the effective date for the waste has been reached pending final approval of such a land disposal permit application.

2. Land Disposal Prohibitions and Treatment Standards

- a. A restricted waste identified in ADEM Admin. Code Rule 335-14-9-.03 may not be placed in a land disposal unit without further treatment unless the requirements of ADEM Admin. Code Rules 335-14-9-.03 and/or .04 are met.
- b. The storage of hazardous wastes restricted from land disposal under ADEM Admin. Code Chapter 335-14-9 is prohibited unless the requirements of ADEM Admin. Code Rule 335-14-9-.05 are met.

II.M. ORGANIC AIR EMISSION REQUIREMENTS

1. General Introduction

a. Process Vents and Equipment

Phase I Organic Air Emission Standards consist of ADEM Admin. Code Rules 335-14-5-.27 and 335-14-5-.28 for hazardous waste treatment, storage, and disposal (TSD) facilities. ADEM Admin. Code Rule 335-14-5-.27 contains emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that process hazardous waste with an annual average total organic concentration of at least ten (10) parts per million by weight (ppmw). ADEM Admin. Code Rule 335-14-5-.28 contains emission standards that address leaks from specific equipment (i.e., pumps, valves, compressors, etc.) containing or contacting hazardous waste with a total organic concentration of at least ten-percent by weight.

b. Tanks, Containers, Surface Impoundments and Miscellaneous Units

The Phase II Organic Emission Standards consist of ADEM Admin. Code Rule 335-14-5-.29 for hazardous waste treatment, storage, and disposal facilities, including certain hazardous waste generator standards for accumulating waste

on-site in RCRA permit-exempt (90-day) tanks and containers. In general, under these standards air emission controls must be used for tanks, surface impoundments, containers, and miscellaneous units that contact hazardous waste containing an average organic concentration greater than 500 ppmw at the point of origination determined by the procedures outlined in ADEM Admin. Code Rule 335-14-5 .29.

2. Notification of New Units

a. Process Vents and Equipment

Prior to constructing any equipment with process vents subject to the requirements of ADEM Admin. Code Rule 335-14-5-.27, or installing any additional equipment subject to the requirements of ADEM Admin. Code Rule 335-14-5-.28, or prior to modifying the current process such that existing equipment previously not subject to the requirement of ADEM Admin. Code Rule 335-14-5-.28 the Permittee shall supply the specific Part B information required pursuant to ADEM Admin. Code Rules 335-14-8-.02(15) and 335-14-8-.02(16) as applicable, and shall obtain a permit modification in accordance with the requirements of ADEM Admin. Code Rule 334-14-8-.04(3) and Condition I.J of this permit.

b. Tanks, Containers, Surface Impoundments, Miscellaneous Units

Prior to installing any tank, container, surface impoundment or miscellaneous unit subject to ADEM Admin. Code Rule 335-14-5-.29, or modifying an existing process waste handling or tank or container such that the unit(s) will become subject to ADEM Admin. Code Rule 335-14-5-.29, the Permittee shall obtain a permit modification under ADEM Admin. Code Rule 335-14-8-.04(3), and provide specific Part B application information required under ADEM Admin. Code Rules 335-14-8-.02(5) –thru (8) and 335-14-8-.02(18), as applicable, with the modification request.

II.N. WASTE REJECTION NOTIFICATION (RESERVED)

II.O. MANIFEST SYSTEM (RESERVED)

II.P. LOADING OF OUTGOING WASTES VIA RAILCAR (RESERVED)

II.Q. CONSTRUCTION COMPLIANCE SCHEDULE FOR PROPOSED UNITS (RESERVED)

PART III

MANAGEMENT IN TANKS

III.A. PERMITTED OPERATIONS

The Permittee may operate the units and processes described in Table III.1. or Table III.2. of this permit, subject to the terms of this permit. Operation of any process or unit not listed in Table III.1. or Table III.2. of this permit, operation of any process in a unit or area other than that for which the process is listed, or exceedance of any capacity listed therein, for the treatment, storage, or disposal of hazardous waste is prohibited.

III.B. WASTE IDENTIFICATION

1. The Permittee may store the hazardous wastes listed in Appendix N of the permit application in tanks at the facility, subject to the terms of this permit. The storage or treatment of any hazardous waste not listed in Appendix N of the permit application is prohibited.
2. The Permittee shall not store or treat mixed waste in tanks at the facility.

III.C. STORAGE IN TANKS

1. The tank storage capacity is distributed among the various tanks and tank farms as shown in Table III.1. of this permit, and as described in Appendix N of the permit application. The maximum quantity of hazardous waste stored in each unit or containment area shall not exceed the capacity listed in Table III.1. of this permit.
2. The Permittee shall maintain and operate the tank storage areas in accordance with the procedures specified in Appendix N of the permit application and in ADEM Admin. Code Rule 335-14-5-.10.
3. The maximum combined quantity of hazardous and non-hazardous wastes stored in a given area shall not exceed ten times the capacity of the containment system for that area. The maximum combined quantity of hazardous and non-hazardous wastes stored in an individual tank in a given area shall not exceed the capacity of the containment system for that area.

III.D. TREATMENT IN TANKS (RESERVED)

III.E. INSTALLATION REQUIREMENTS

The tank system must be installed in accordance with Appendix N of the permit application and ADEM Admin. Code Rule 335-14-5-.10(3).

III.F. GENERAL OPERATING REQUIREMENTS

1. The Permittee shall comply with the tank-operating requirements of ADEM Admin. Code Rules 335-14-5-.02(6), 335-14-5-.10(2), 335-14-5-.10(5)(a), 335-14-5-.10(5)(b), 335-14-5-.10(5)(c), and 335-14-5-.10(6)(b).

2. Each tank will be labeled or marked with all appropriate EPA hazardous waste numbers associated with the hazardous waste(s) in the tank as specified in 335-14-2-.03 and 335-14-2-.04 (or other information that provides a clear indication of the type(s) of hazardous waste(s) in the tank and the hazard(s) associated with that waste).

III.G. SECONDARY CONTAINMENT REQUIREMENTS

The Permittee shall maintain the secondary containment systems for all storage and/or treatment tanks and for all ancillary equipment as specified in Appendix I and Appendix N of the permit application and in accordance with the requirements of ADEM Admin. Code Rule 335-14-5-.10(4).

III.H. INSPECTIONS

1. The Permittee shall inspect each tank system (to include the ancillary equipment and secondary containment) and the area surrounding each tank as specified in Appendix D of the permit application and in accordance with the requirements of ADEM Admin. Code Rule 335-14-5-.10(6).
2. The Permittee must document weekly in the operating record of the facility the results of inspection required by Condition III.H.1 of this permit.

III.I. RESPONSE TO LEAKS OR SPILLS

The Permittee shall comply with the requirements of ADEM Admin. Code Rule 335-14-5-.10(7).

III.J. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTES

The Permittee shall comply with the requirements specified in Section 7 of Appendix B of the permit application and in accordance with the requirements of ADEM Admin. Code Rule 335-14-5-.10(9).

III.K. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTES

The Permittee shall comply with the requirements specified in Section 7 of Appendix B of the permit application and in accordance with the requirements of ADEM Admin. Code Rule 335-14-5-.10(10).

III.L. CLOSURE

1. Following the receipt of the final volume of hazardous waste, the Permittee shall close the tank in accordance with the Closure Plan contained in Appendix J of the permit application and in accordance with the requirements of ADEM Admin. Code Rule 335-14-5-.10(8).
2. If at closure not all contaminated soils can be practically removed or decontaminated, the Permittee shall close the tank as a landfill and perform post-closure care as specified in ADEM Admin. Code Rule 335-14-5-.10(8)(b).

TABLE III.1.
STORAGE IN TANKS

UNIT NAME	TANKS	PERMITTED STORAGE CAPACITY (units)	CONTAINMENT CAPACITY (units)	DESCRIPTION OF UNIT (Section ¹)	LOCATION OF UNIT (Figure ¹)
Boiler #7 Hazardous Waste Tanks	UT-V-813	31,000	69,902.73	Appendix N	Attachment A of Appendix I
	UT-V-814	31,000			
Total Tank Storage Capacity	-	62,000	69,902.73	-	-

1. Location in permit application containing description (text) or location (figure) of unit.

TABLE III.2 (RESERVED)

PART IV

MANAGEMENT IN BOILER #7

IV.A. PERMITTED OPERATIONS

The Permittee may operate the units and processes described in Table IV.1. of this permit, subject to the terms of this permit. Operation of any process or unit not listed in Table IV.1. of this permit, operation of any process in a unit or area other than that for which the process is listed, or exceedance of any capacity listed therein, for the treatment, storage, or disposal of hazardous waste is prohibited.

IV.B. WASTE IDENTIFICATION

1. The Permittee may treat the hazardous wastes listed in Section 2 of Appendix I of the permit application, subject to the terms of this permit. The storage or treatment of any hazardous waste not listed in Section 2 of Appendix I of the permit application is prohibited.
2. The Permittee shall not store or treat mixed waste in miscellaneous units at the facility.

IV.C. TREATMENT IN BOILER #7

1. The Permittee shall comply with the treatment process and capacity restrictions listed in Table IV.1. of this permit and Appendix I of the permit application.
2. The Permittee shall ensure all areas used for the treatment of waste are in good condition and are of sufficient structural integrity and composition to allow for the safe treatment of the waste(s) managed.
3. The Permittee shall not substitute dilution of hazardous wastes for treatment, except as allowed by ADEM Admin. Code Rule 335-14-9-.01(3).
4. The Permittee shall ensure that the treatment process(es) utilized complies with any and all regulatory requirements promulgated by ADEM and/or USEPA regarding the release of hazardous constituents to the environment.
5. The Permittee shall conduct the treatment process in accordance with the procedures specified in Appendix I of the permit application.
6. The Permittee shall not treat incompatible wastes or residues, other than as specifically described in Appendix B and Appendix I of the permit application, in the same containment area. Whenever incompatible wastes or residues are treated in the same containment area, either in the same or subsequent batches, the Permittee shall comply with Condition IV.G. of this permit.
7. The Permittee shall ensure that all chemical reactions have sufficiently occurred to prevent subsequent uncontrolled reactions before the process is stopped.
8. The Permittee shall manage all treatment residues in accordance with all applicable provisions of ADEM Admin. Code Divisions 335-13 and/or 335-14.

9. The Permittee shall manage the boiler in accordance with the 40 CFR 63 Subpart EEE Hazardous Waste Combustion MACT air emission standards and the Title V Air Permit No. 108-0003.
10. The Permittee shall monitor the incoming boiler feed in accordance with Section 4.1 of Appendix I of the permit application to ensure consistency with permitted emission levels, and that boiler design capacities are not exceeded.
11. The Permittee shall conduct startup and shutdown procedures for the boiler in accordance with Section 3.2.1 of Appendix I of the permit application and the Title V permit required operations plan.
12. The Permittee shall enter records of all treatment activities, including hazardous waste numbers and descriptions, quantities, method(s) of treatment, and date(s) of treatment, into the operating record for each batch of waste treated.

IV.D. CONTAINMENT

The Permittee shall maintain the containment systems of the Boiler #7 area in accordance with Section 3.1.4 of Appendix I of the permit application.

IV.E. INSPECTIONS

The Permittee shall inspect Boiler #7 area as specified in Appendix D and Appendix I of the permit application and as required by ADEM Admin. Code Rules 335-14-5-.02(6) and 335-14-7-.08.

IV.F. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTES

The Permittee shall comply with the requirements specified in Section 7 of Appendix B of the permit application and ADEM Admin. Code Rule 335-14-5-.02(8).

IV.G. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTES

The Permittee shall comply with the requirements specified in Section 7 of Appendix B of the permit application and in accordance with the requirements of ADEM Admin. Code Rule 335-14-5-.02(8).

IV.H. CLOSURE

1. Following the receipt of the final volume of waste, the Permittee shall close Boiler #7 area in accordance with the requirements of the Closure Plan in Appendix J of the permit application, and ADEM Admin. Code Rules 335-14-5-.07(2) and 335-14-7-.08.
2. If at closure not all waste and contaminated structures and soils at a unit can be removed or decontaminated, the Permittee shall close Boiler #7 area as a landfill and perform post-closure care as specified in ADEM Admin. Code Rule 335-14-5-.14(11)

TABLE IV.1**TREATMENT IN BOILER UNITS**

TREATMENT PROCESS (Code¹)	UNIT(S) PERMITTED	PERMITTED TREATMENT CAPACITY (Million BTU Per Hour)	CONTAINMENT CAPACITY (gallons)	DESCRIPTION OF UNIT/PROCESS (Section²)	LOCATION OF UNIT/PROCESS (Figure²)
T80	Boiler #7	143.7	101.66	Appendix I	Appendix I

1. Treatment process codes as defined in ADEM Admin. Code Rules 335-14-5-Appendix I.
2. Location in permit application containing description (text) or location (figure) of unit.

PART V**MANAGEMENT IN ABOVE GROUND LANDVAULT #2****V.A. PERMITTED OPERATIONS**

The Permittee may operate the units and processes described in Table V.1. of this permit, subject to the terms of this permit. Operation of any process or unit not listed in Table V.1. of this permit, operation of any process in a unit or area other than that for which the process is listed, or exceedance of any capacity listed therein, for the treatment, storage, or disposal of hazardous waste is prohibited.

V.B. WASTE IDENTIFICATION

1. The Permittee may dispose of the hazardous wastes listed in Appendix H of the permit application in the landvault, subject to the terms of this permit. The disposal of any hazardous waste not listed in Appendix H of the permit application is prohibited.
2. The Permittee is prohibited from disposing of any hazardous waste in the landvault which does not meet all applicable treatment standards.
3. The Permittee shall not dispose of mixed waste in the landvault at the facility.

V.C. DISPOSAL IN LANDVAULTS

1. The Permittee shall comply with the landvault disposal capacity restrictions listed in Table V.1. of this permit.
2. The Permittee shall maintain and operate the landvault in accordance with the procedures specified in Appendix H of the permit application.

V.D. DESIGN AND OPERATING REQUIREMENTS

The Permittee shall operate the landvault as described in Appendix H of the permit application, and as required under ADEM Admin. Code Rule 335-14-5-.14(2). In addition, the Permittee shall design and operate the landvault in accordance with the following conditions:

1. The Permittee shall install two liners and associated leachate collection and removal systems (one above the primary liner and one between the liners) for each cell, in accordance with the design plans and reports contained in Section 3 of Appendix H of the permit application and as required by ADEM Admin. Code R. 335-14-5-.14(2)(b).
2. Collected leachate must be managed in accordance with the design plans and reports contained in Appendix H of the permit application.
3. The Permittee shall locate, construct, operate, and maintain the landvault as specified in Appendix H of the permit application, so as to prevent the migration of any hazardous constituent into the groundwater or surface water, at least as effectively as the liners and leachate collection and removal systems outlined in ADEM Admin. Code Rule 335-14-5-.14(2).

4. The Permittee shall construct, operate, and maintain the leachate collection and removal systems as described in Section 3 of Appendix H of the permit application.
 - a. The Permittee shall not allow leachate to accumulate to a depth of more than one foot over the liner of each landvault cell, in accordance with the requirements of ADEM Admin. Code Rule 335-14-5-.14(2)(b)2. and as described in Appendix H of the permit application. The Permittee shall record the leachate level in each leachate collection sump and each leak detection sump at least once each week during the active life and closure period of each landfill unit.
 - b. The Permittee shall operate the leak detection system in accordance with the requirements of ADEM Admin. Code Rule 335-14-5-.14(2)(b)3., 335-14-5-.14(2)(b)4., and 335-14-5-.14(2)(b)5., and as described in Appendix H of the permit application so as to minimize the head on the bottom liner of each landvault cell.
 - c. The Permittee shall construct, operate, and maintain the pressure relief systems for the landvault as described in Appendix H of the permit application.
 - d. The Permittee shall comply with the action leakage rate requirements of ADEM Admin. Code Rule 335-14-5-.14(3), for all future cell construction. The Permittee shall submit action leakage rates to the Department for approval prior to initiating construction activities.
 - e. The Permittee shall record, at least once each week, the amount of liquids removed from each leachate collection sump and from each leak detection sump during the active life and closure period of each landvault unit. (ADEM Admin. Code Rule 335-14-5-.14(4)(c)).
5. The Permittee shall design, construct, operate, and maintain a run-on control system in accordance with the design plans, specifications and operating practices contained in Appendix H of the permit application and as required by ADEM Admin. Code Rule 335-14-5-.14(2)(c).
6. The Permittee shall design, construct, operate, and maintain a run-off management system in accordance with the design plans, specifications and operating practices contained in Appendix H of the permit application. (ADEM Admin. Code Rule 335-14-5-.14(2)(d)).
7. The Permittee shall prevent wind dispersal of hazardous wastes and hazardous constituents from the landvault as described in Appendix H of the permit application and as required by ADEM Admin. Code Rule 335-14-5-.14(2)(f).
8. All waste placed into the landvault shall be tested, prior to placement, in accordance with the Waste Analysis Plan as described in Appendix B of the permit application and ADEM Admin. Code Rule 335-14-5-.02(4).
9. The Permittee shall prepare a response action plan as required by ADEM Admin. Code R. 335-14-5-.14(5) prior to placing waste in future landvault cells. If the flow rate into the

leak detection system exceeds the action leakage rate set forth in Part V.D.4.d of this permit, the Permittee shall implement the response action plan. At a minimum, as required by ADEM Admin. Code Rule 335-14-5-.14(5), the Permittee must:

- a. Notify the Department in writing of the exceedance within seven days of the determination;
- b. Submit a preliminary written assessment to the Department within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;
- c. Determine to the extent practicable the location, size, and cause of any leak;.
- d. Determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed;
- e. Determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks; and
- f. Within 30 days after the notification that the action leakage rate has been exceeded, submit to the Department the results of the analyses specified in Conditions V.D.9.c., V.D.9.d., and V.D.9.e. of this permit, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the Permittee must submit to the Department a written report summarizing the results of any remedial actions taken and actions planned;
- g. The monthly report should include:
 - i.
 - (I) Assess the source(s) of liquids and amounts by source;
 - (II) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source(s) of liquids and possible location(s) of any leaks, and the hazard and mobility of the liquid; and
 - (III) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or
 - ii. Document why the assessments required by Condition V.D.9.g.i. of this permit are not necessary.

10. All precipitation which falls into a landvault and contacts hazardous waste or other disposed materials (e.g., non-hazardous waste, daily cover materials, etc.) must be managed as hazardous waste leachate (EPA Hazardous Waste Number F039). Any precipitation which is collected prior to contact with hazardous waste or other disposed materials may be managed in accordance with the applicable requirements of the Permittee's National Pollutant Discharge Elimination System (NPDES) discharge permit (Permit No AL0003093) issued by the Department. The Permittee may solidify, in-place

(on the surface), precipitation that comes in contact with landvault waste prior to it reaching the leachate detection sump, provided that dust emissions are controlled.

V.E. INSPECTION SCHEDULES

The Permittee shall inspect the landvault in accordance with the following conditions:

1. The Permittee shall inspect the liners and cover systems during construction and installation for uniformity, damage and imperfections (e.g., holes, cracks, thin spots or foreign materials). (ADEM Admin. Code Rule 335-14-5-.14(4)(a)).
2. The Permittee shall inspect all new landvault cells immediately after construction or installation for the following: (ADEM Admin. Code R. 335-14-5-.14(4)(a))
 - a. Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, excessive folds, punctures or blisters.
 - b. Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.
3. The Permittee shall inspect all constructed systems (e.g., bottom liners, sand windows, sidewall liners, etc.) immediately prior to covering to insure that the subject system has not been compromised (e.g., rips, tears, UV degradation, silting of sand or fabrics, etc.).
4. The Permittee shall inspect all landvaults (including the liner, leachate collection system, temporary covers, and final cover systems) in accordance with Appendix D of the permit application and Condition V.E.5. of this permit. (ADEM Admin. Code Rule 335-14-5-.02(6)).
5. The landvault must be inspected weekly and after storms to detect evidence of the following: (ADEM Admin. Code Rule 335-14-5-.14(4)(b))
 - a. Deterioration, malfunctions, or improper operation of run-on and run-off systems;
 - b. Proper functioning of wind dispersal control systems, where present; and
 - c. The presence of leachate in, and proper functioning of, leachate collection and removal systems, , where present.

V.F. CELL LOCATION SURVEYING

The Permittee shall maintain the following items in the operating record as required by ADEM Admin. Code Rules 335-14-5-.05(4) and 335-14-5-.14(10):

1. A map with the exact location and dimensions (including depth and top and bottom elevations) of each cell with respect to permanently surveyed benchmarks; and

2. The types of waste in each cell and the approximate location of each hazardous waste shipment within each cell.

V.G. SPECIAL LANDVAULT PROVISIONS FOR IGNITABLE OR REACTIVE WASTES

The Permittee shall not place ignitable or reactive waste in any landvault cell, except as provided by ADEM Admin. Code Rule 335-14-5-.14(13).

V.H. SPECIAL LANDVAULT PROVISIONS FOR INCOMPATIBLE WASTES

The Permittee shall not place incompatible wastes, or incompatible wastes and materials, in the same landvault cell, except as provided by ADEM Admin. Code Rule 335-14-5-.14(14).

V.I. SPECIAL LANDVAULT PROVISIONS FOR HAZARDOUS WASTES RESTRICTED FROM LANDVAULT UNITS

1. The Permittee shall not place any hazardous waste(s) which is prohibited from land disposal, or which does not meet all applicable land disposal restrictions (LDR) treatment standards (as listed in ADEM Admin. Code Chapter 335-14-9 [40 CFR 268]), in any landvault cell.
2. The Permittee shall not dispose of any F020, F021, F022, F023, F026, F027, or F028 listed hazardous waste(s) in any landvault unit, except in a form (e.g., incineration residues) which meets all applicable requirements of ADEM Admin. Code Chapter 335-14-9, pursuant to ADEM Admin. Code Rule 335-14-5-.14(18).

V.J. SPECIAL LANDVAULT PROVISIONS FOR LIQUID WASTES

1. The Permittee shall not place bulk or non-containerized liquid wastes, or waste containing free liquids, in any landvault unit, in accordance with ADEM Admin. Code Rule 335-14-5-.14(15)(b). [Note: The application of non-contaminated water or leachate treated to F039 standards for dust control purposes within the landvault is not prohibited by this permit condition.]
2. The Permittee shall demonstrate the absence of free liquids in all containerized or bulk waste which is suspected (by the Permittee or the Department) to contain free liquids. This demonstration shall be made by the following test: "Method 9095 (Paint Filter Liquid Test)" as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (EPA Publication No. SW-846, as incorporated by reference in ADEM Admin. Code Rule 335-14-1-.02(2)).
3. Containers holding free liquids shall not be placed in any landvault unit unless the requirements of ADEM Admin. Code Rule 335-14-5-.14(15)(d) are met.
4. All sorbents used to treat free liquids (whether containerized or noncontainerized) to be disposed of in the landvault shall be non-biodegradable, and shall comply with the requirements of ADEM Admin. Code Rule 335-14-5-.14(15)(e).
5. The Permittee shall not dispose of any liquid which is not a hazardous waste in any landvault unit, except as provided in ADEM Admin. Code Rule 335-14-5-.14(15)(f).

V.K. SPECIAL LANDVAULT PROVISIONS FOR CONTAINERS

1. Except as provided in Condition V.K.3. of this permit, the Permittee shall not dispose of any containers in any landvault that are larger than ampules unless they are filled at least 90% full or are crushed, shredded or similarly reduced in volume to the maximum practical extent before placement in the landvault. (ADEM Admin. Code Rule 335-14-5-.14(16))
2. The Permittee shall not dispose of small containers of hazardous waste in overpacked drums (i.e., lab packs), except as provided by ADEM Admin. Code Rule 335-14-5-.14(17).
3. The Permittee may place empty containers in a landvault unit provided each such container is crushed to the maximum practical extent before burial, in accordance with the provisions of ADEM Admin. Code Rule 335-14-5-.14(16)(b).

V.L. RESERVED

V.M. REPORTING REQUIREMENTS

The Permittee shall submit written reports to the Department, within 60 days after the first anniversary of the effective date of this permit, and annually thereafter, which include:

1. All data collected in accordance with Conditions V.D.4.a. and V.D.4.e. of this permit;
2. The total tonnage, by major waste category (e.g., RCRA, TSCA, CERCLA, non-hazardous, etc.), of waste disposed each calendar month of the preceding year; and
3. The tabulated results of all leachate analyses conducted during the preceding year.

V.N. CLOSURE AND POST-CLOSURE CARE

The Permittee shall conduct closure and post-closure activities in accordance with the following conditions:

1. The Permittee shall close each landvault following the receipt of the final volume of hazardous waste and in accordance with the closure plan in Appendix J of the permit application and the requirements of ADEM Admin. Code Rules 335-14-5-.07 and 335-14-5-.14 (11). Until plant growth has been established on the cap(s), the topsoil shall be stabilized through chemical or physical means to prevent erosion.
2. The Permittee shall monitor and maintain each landvault in accordance with the post-closure plan in Appendix K of the permit application and ADEM Admin. Code R. 335-14-5-.07 [(8) through (11)] and 335-14-5-.14(11) and Part VI of this permit.

TABLE V.1.
DISPOSAL IN LANDVAULT

UNIT NAME	PERMITTED DISPOSAL CAPACITY (Cubic Yards)	DESCRIPTION OF UNIT (Section¹)	LOCATION OF UNIT (Figure¹)
Landvault #2	290,000	Appendix H	Appendix H
Total Landvault Disposal Capacity	290,000		

1. Location in permit application containing description (text) or location (figure) of unit.

PART VI**POST-CLOSURE CARE****VI.A. POST-CLOSURE CARE PERIOD**

The post-closure care period shall extend for a period of thirty (30) years after the date of acceptance of certification of closure of the last operational unit at the facility, unless shortened or extended pursuant to ADEM Admin. Code Rule 335-14-5-.07(8). The post-closure care period shall automatically extend through the end of the compliance period specified in Condition IX.B.4. of this permit.

VI.B. POST-CLOSURE PROCEDURES AND USE OF PROPERTY**1. Post-Closure Activities**

The Permittee shall conduct post-closure care activities, in accordance with Appendix K of the permit application and as required by ADEM Admin. Code Rules 335-14-5-.07 and 335-14-5-.14(11)(d), for each hazardous waste management unit listed in Appendix K. Post-closure care shall commence upon the effective date of this permit, and shall continue throughout the post-closure care period.

2. Security

The Permittee shall comply with the security provisions of ADEM Admin. Code Rule 335-14-5-.02(5) as described in Appendix C of the permit application.

3. Disturbance of Closed Unit(s)

The Permittee shall not allow the disturbance of the integrity of the final cover, liners, any components of the containment system, or the function of the facility's monitoring systems during the post-closure care period for any unit identified in Table VI.1.

4. The Permittee shall:

- a. Maintain the integrity and effectiveness of the landfills' final cover, including making repairs to the cap, as necessary, to correct the effects of settling, subsidence, erosion, or other events;
- b. Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of ADEM Admin. Code Rule 335-14-5-.06 and Part IX of this permit;
- c. Prevent run-on and run-off from eroding or otherwise damaging the final cover; and
- d. Protect and maintain surveyed benchmarks used in complying with the surveying and recordkeeping requirements of ADEM Admin. Code Rule 335-14-5-.14(10).

5. The Permittee shall operate and maintain the leachate collection, removal, and leak detection systems of all landfill units whose construction includes synthetic bottom liners (e.g., Landvaults #1 and #2) throughout the post-closure period, as required by ADEM Admin. Code Rule 335-14-5-.14(11)(d), and as described in Appendix H and Appendix K of the permit application.
 - a. The Permittee shall not allow leachate to accumulate to a depth of more than one foot over the liner of each landfill cell, in accordance with the requirements of ADEM Admin. Code Rules 335-14-5-.14(2)(b)2. and 335-14-5-.14(11)(d), and as described in Appendix H and Appendix K of the permit application. Except as provided in Condition VI.B.5.d. of this permit, the Permittee shall record the leachate level in each leachate collection sump and each leak detection sump at least once each month during the post-closure care period of each landfill unit.
 - b. The Permittee shall operate the leak detection system in accordance with the requirements of ADEM Admin. Code Rules 335-14-5-.14(2)(b)3., 335-14-5-.14(2)(b)4., 335-14-5-.14(2)(b)5., and 335-14-5-.14(11)(d), and as described in Appendix H and Appendix K of the permit application so as to minimize the head on the bottom liner of each landfill cell.
 - c. The Permittee shall comply with the action leakage rate requirements of ADEM Admin. Code Rule 335-14-5-.14(3).
 - d. After the certification of closure of a landfill unit has been accepted by the Department in accordance with ADEM Admin. Code Rule 335-14-5-.07(6), the Permittee shall record the amount of liquids removed from each leachate collection sump and leak detection sump at least once each month throughout the post-closure care period for each landfill unit. If the liquid levels in all sumps of a landfill unit stay below the pump operating levels, as defined in ADEM Admin. Code Rule 335-14-5-.14(4)(c)3, for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid levels in the sumps stay below the pump operating levels for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at a landfill unit on a quarterly or semi-annually recording schedule, the Permittee must return to monthly recording of amounts of liquids removed from each sump of that landfill unit until the liquid levels again stay below the pump operating level for two consecutive months, as required by ADEM Admin. Code Rule 335-14-5-.14(4)(c)2.
6. If the flow rate into the leak detection system exceeds the action leakage rate set forth in Part VI.B.5 of this permit, the Permittee shall implement the response action plan contained in Appendix H and Appendix K of the permit application. At a minimum, as required by ADEM Admin. Code Rule 335-14-5-.14(5), the Permittee must:
 - a. Notify the Department in writing of the exceedance within seven (7) days of the determination;

- b. Submit a preliminary written assessment to the Department within fourteen (14) days of the determination, as to the amount of liquids, likely source(s) of liquids, possible location, size, and cause of any leak(s), and short-term actions taken and planned;
 - c. Determine to the extent practicable the location, size, and cause of any leak;
 - d. Determine whether any waste should be removed from the unit for inspection, repairs, or controls;
 - e. Determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks; and
 - f. Within 30 days after the notification that the action leakage rate has been exceeded, submit to the Department the results of the analyses specified in Conditions VI.B.6.c., VI.B.6.d., and VI.B.6.e. of this permit, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the Permittee must submit to the Department a written report summarizing the results of any remedial actions taken and actions planned.
 - g. To make the leak and/or remediation determinations required by Conditions VI.B.6.c., VI.B.6.d., and VI.B.6.e. of this permit, the Permittee must:
 - i.
 - (I) Assess the source(s) of liquids and amounts by source;
 - (II) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source(s) of liquids and possible location(s) of any leaks, and the hazard and mobility of the liquid; and
 - (III) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or
 - ii. Document why the assessments required by Condition VI.B.6.g.i. of this permit are not necessary
7. The Permittee shall conduct periodic evaluations of the landvault cover systems at the facility. The Permittee may consider periodic surveys, establishment of settlement plates, evaluation of aerial photographs, or other methods in the evaluation.
8. Reporting Requirements
- The Permittee shall submit reports to the Department, within 60 days after the first anniversary of the effective date of this permit, and annually thereafter, which include:
- a. All data collected in accordance with Conditions VI.B.5.a. and VI.B.5.d. of this permit;
 - b. All data collected in accordance with Condition VI.B.7. of this permit;

- c. The tabulated results of all leachate analyses during the preceding year.

VI.C. INSPECTIONS

- 1. The Permittee shall inspect the components, structures, and equipment at the site in accordance with the inspection schedule as described in Appendix D of the permit application and as required by ADEM Admin. Code Rules 335-14-5-.02(6) and 335-14-5-.07.

- 2. Monitoring and Inspection

The Permittee shall inspect the closed hazardous waste management units listed in Table VI.1. to detect any evidence of deterioration or improper operation at least quarterly and after storms in accordance with Section 5.0 of Appendix D of the permit application, and as required under ADEM Admin. Code Rules 335-14-5-.02(6), 335-14-5-.07 and 335-14-5-.14. The inspections shall specifically include evaluation of the following items:

- a. Integrity of the final cover (erosion, ponding, subsidence, cracking, etc.);
- b. All data collected in accordance with Condition VI.B.5.a, VI.B.5.b, and VI.B.7. of this permit;
- c. Run-on and run-off control system;
- d. Groundwater monitoring wells; and
- e. Survey benchmarks.

VI.D. NOTICES AND CERTIFICATION

- 1. No later than 60 days after certification of closure of each hazardous waste disposal unit, the owner or operator must submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department a record of the type, location, and quantity of hazardous wastes disposed of within each cell or other disposal unit of the facility. For hazardous wastes disposed of before January 12, 1981, the owner or operator must identify the type, location, and quantity of the hazardous wastes to the best of his knowledge and in accordance with any records he has kept.
- 2. Within 60 days of certification of closure of the first hazardous waste disposal unit and within 60 days of certification of closure of the last hazardous waste disposal unit, the owner or operator must:
 - a. Record, in accordance with State of Alabama law, a notation on the deed to the facility property or on some other instrument which is normally examined during title search that will in perpetuity notify any potential purchaser of the property that:
 - i. The land has been used to manage hazardous wastes;
 - ii. Its use is restricted under ADEM Admin. Code Rule 335-14-5-.07; and

- iii. The survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the facility required by ADEM Admin. Code Rules 335-14-5-.07(7) and 335-14-5-.07(10)(a) have been filed with the local zoning authority or the authority with jurisdiction over local land use and with the Department; and
 - b. Submit a certification, signed by the owner or operator, that he has recorded the notation specified in Condition VI.D.2.a. of this permit, including a copy of the document in which the notation has been placed, to the Department.
- 3. If the owner or operator or any subsequent owner or operator of the land upon which a hazardous waste disposal unit is located wishes to remove hazardous wastes and hazardous waste residues, the liner, if any, or contaminated soils, he must request a modification to the post-closure permit in accordance with the applicable requirements in ADEM Admin. Code Chapter 335-14-8. The owner or operator must demonstrate that the removal of hazardous wastes will satisfy the criteria of ADEM Admin. Code Rule 335-14-5-07(8)(c). By removing hazardous waste, the owner or operator may become a generator of hazardous waste and must manage it in accordance with all applicable requirements of Division 14. If he/she is granted a permit modification or otherwise granted approval to conduct such removal activities, the owner or operator may request that the Director approve either.
 - a. The removal of the notation on the deed to the facility property or other instrument normally examined during title search; or
 - b. The addition of a notation to the deed or instrument indicating the removal of the hazardous waste.

TABLE VI.1.
POST-CLOSURE CARE UNITS

UNIT NAME	UNIT DESCRIPTION	CLOSED-IN-PLACE CAPACITY (Cubic Yards)	DESCRIPTION OF UNIT²	LOCATION OF UNIT (Northern and Easting Coordinates)
Landvault #1	Landvault	185,530 ¹	Appendix K-Part II.C.	N23+12.00 E68+34.00 ³
Class “C” Landfill	Landfill	116,970 ^{1,7}	Appendix K-Part II.A.1	N24+45.00 E73+77.00
Biological Sludge Landfill	Landfill	116,741 ^{1,7}	Appendix K-Part II.A.2	N02+48.00 E46+17.00
Rectangular/Triangular Ponds	Pond	23,064 ^{1,7,8}	Appendix K-Part II.A.3	N02+48.00 E46+17.00 ⁴
Sludge 1 - 4/5-day /10-day /Equalization Impoundments	Impoundment	733,419 ^{1,7}	Appendix K-Part II.B.4 - 7	N22+68.00 E61+03.00 ⁶
Dilute / Diazinon Destruction Impoundments	Impoundment	534,825 ^{1,7,8}	Appendix K-Part II.B.2 - 3	N07+00.00 E55+07.00 ⁵
GM-44 Impoundment	Impoundment	149,102 ^{1,7,8}	Appendix K-Part II.B.1	N04+09.00 E32+15.00
Landvault #2	Landvault	290,000 ⁹	Appendix K – Part II.D.	N31+96, E71+80, E67+47 and N43+25

Footnote:

- ¹ Total in-place capacity excludes cap (generally cap thickness is 3 to 4 ft).
- ² Location of descriptive text and other pertinent data in the permit application.
- ³ Coordinates of the geographical center of the unit.
- ⁴ The Rectangular and Triangular Ponds were closed as a single unit.
- ⁵ The Diazinon Destruct and Dilute Impoundments were closed as a single unit.
- ⁶ Sludge Impoundments #1 through #4, the 5-day Impoundment, the 10-day Impoundment, and the Equalization Impoundment were closed as a single unit.
- ⁷ Closed in place capacities not available for the “Class C”, Biological Sludge Landfills nor the Sludge Impoundments #1 through #4. The listed capacities were estimated.
- ⁸ Closed as “Contingency Closures” with all hazardous wastes removed from the unit.
- ⁹ Landvault #2 is still in operation. Please refer to Part V of the Permit.

PART VII

SOLID WASTE MANAGEMENT UNIT AND AREAS OF CONCERN IDENTIFICATION AND EVALUATION

VII.A. APPLICABILITY

The Conditions of this Part apply to:

1. The solid waste management units (SWMUs) and areas of concern (AOCs) identified in Table VII.1., which require investigation and/or remediation;
2. The SWMUs identified in Table VII.2., which require no further investigation under this permit at this time;
3. The SWMUs identified in Table VII.3., which require actions under other programs, such as Comprehensive Environmental Response Compensation and Liability Act (CERCLA), etc., and this permit;
4. The SWMUs/AOCs identified in Table VII.4, which require Interim Measures and/or Source Removal;
5. The SWMUs/AOCs identified in Table VII.6, which require a Corrective Measures Implementation (CMI) Plan.
6. Any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means; and,
7. Contamination beyond the facility boundary, if applicable. The Permittee shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Department that, despite the Permittee's best efforts, as determined by the Department, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. Assurance of financial responsibility for completion of such off-site corrective action will be required.

VII.B. NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUs AND AOCs

1. The Permittee shall notify the Department in writing, within 15 calendar days of discovery, of any additional AOC(s) as described under Permit Condition VII.A.6. The notification shall include, at a minimum, the location of the AOC(s) and all available information pertaining to the nature of the release (*e.g.*, media affected, hazardous constituents released, magnitude of release, etc.). If the Department determines that further investigation of an AOC is required, the permit will be modified in accordance with ADEM Admin. Code Rule 335-14-8-.04(2).

2. The Permittee shall notify the Department in writing, within 15 calendar days of discovery, of any additional SWMUs as described under Permit Condition VII.A.6.
3. The Permittee shall prepare and submit to the Department, within 90 calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Permit Condition VII.B.2. At a minimum, the SAR shall provide the following information:
 - a. Location of unit(s) on a topographic map of appropriate scale such as required under ADEM Admin. Code Rule 335-14-8-.02(5)(b)19.
 - b. Designation of type and function of unit(s).
 - c. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings).
 - d. Dates that the unit(s) was operated.
 - e. Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes.
 - f. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include soil analyses, air, groundwater data, and/or surface water data).
4. Based on the results of the SAR, the Department shall determine the need for further investigations at the SWMUs covered in the SAR. If the Department determines that such investigations are needed, the Permittee shall initiate an investigation as outlined in Permit Condition VII.D.1. immediately upon receiving notification of the Department's determination.

VII.C. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES AT PREVIOUSLY IDENTIFIED SWMUs or AOCs

1. The Permittee shall notify the Department in writing of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within 15 calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Permit Condition VII.A.6. or SWMUs or AOCs identified in Permit Condition VII.A.2. for which further investigation was not required.
2. If the Department determines that further investigation of the SWMUs or AOCs is needed, the Permittee shall initiate an investigation as outlined in Permit Condition VII.D. immediately upon receiving notification of the Department's determination.

VII.D. RCRA FACILITY INVESTIGATION (RFI)

1. The Permittee must perform an RFI for any SWMU and AOC identified by the Department in accordance with Permit Conditions VII.A.1, VII.B.4, and VII.C.2.

2. The RFI must completely identify the concentration of hazardous constituents released from each SWMU and AOC and fully delineate the area where such hazardous constituents have come to be located.
3. The RFI must fully characterize the nature and extent of contamination released from each SWMU or AOC under investigation.
4. The RFI must be performed in a manner consistent with the most recent edition of the Alabama Environmental Investigation and Remediation Guidance (AEIRG).
5. Except as provided by Permit Condition VII.D.6., the RFI must be completed within 180 calendar days from the effective date of this permit or, for SWMUs or AOCs identified pursuant to Permit Conditions VII.B. and VII.C., within 180 calendar days from the receipt of notification from the Department that an RFI is required. If, prior to the effective date of this permit, the Department has approved a work plan that includes a schedule for completing the RFI, the RFI shall be completed in accordance with the approved schedule.
6. RFI Schedule of Compliance
 - a. For RFIs expected to require greater than 180 calendar days to complete, the Permittee may submit a schedule of compliance subject to Departmental approval and/or modification.
 - b. Submittal of an RFI Schedule of Compliance does not delay or otherwise postpone the Permittee's obligation to initiate the RFI.
 - c. The Schedule of Compliance must include:
 - i. A detailed narrative discussion which explains why the RFI cannot be completed within 180 days; and,
 - ii. A detailed and chronological listing of milestones, with estimated durations, which provides sufficient information to track the progress of the investigation.
 - d. The RFI Schedule of Compliance shall be reviewed by the Department in accordance with Permit Condition VII.G.
 - e. The Permittee shall complete the RFI in accordance with the approved RFI Schedule of Compliance.
7. RFI Progress Reports
 - a. For an RFI being conducted in accordance with the approved RFI Schedule of Compliance, the Permittee must submit progress reports on a monthly basis.
 - b. The RFI Progress Reports must include:
 - i. A description of the RFI activities completed during the reporting period;

- ii. Summaries of any problems or potential problems encountered during the reporting period;
- iii. Actions taken to rectify problems;
- iv. Changes in relevant personnel;
- v. Projected work for the next reporting period;
- vi. Any proposed revisions to the RFI Schedule of Compliance. Modifications of the RFI Schedule of Compliance are subject to approval by the Department; and,
- vii. A summary of any data collected during the reporting period, including:
 - A. The location of each sampling point identified on a site map; and
 - B. The concentration of each hazardous constituent detected at each sampling point;
- c. Submittal of RFI Progress Reports, work plans, or other documents during the RFI does not alter the approved RFI Schedule of Compliance.

8. RFI Reports

- a. The Permittee shall prepare and submit to the Department an RFI Report within 60 calendar days from the completion of investigation activities in accordance with the approved RFI Schedule of Compliance, if applicable.
- b. The RFI Report must provide a detailed description of all required elements of the investigation as described in the most recent edition of the AEIRG.
- c. The RFI Report shall be reviewed by the Department in accordance with Permit Condition VII.G.

VII.E. SELECTION OF CORRECTIVE MEASURES AND PERMIT MODIFICATION

- 1. The Permittee shall develop and submit to the Department a Corrective Measures Implementation (CMI) Plan for any areas of the Permittee's site where hazardous constituents have come to be located at concentrations exceeding those appropriate for the protection of human health and the environment. The CMI Plan must include all applicable elements of the proposed remedy pursuant to the most recent edition of the AEIRG.
- 2. The CMI Plan shall be submitted to the Department within 120 calendar days following the Permittee's submittal of the RFI Report indicating that hazardous constituents have come to be located at any area of the Permittee's facility, or beyond the facility, at concentrations exceeding those appropriate for the protection of human health and the environment, or within 120 calendar days following notification from the Department that a CMI Plan is required, whichever occurs earlier.

3. The CMI Plan shall be submitted along with a request for permit modification pursuant to ADEM Admin. Code Rule 335-14-8-.04(2), and shall include any applicable fees pursuant to ADEM Admin. Code Chapter 335-1-6. This modification will serve to incorporate the proposed final remedy, including all procedures necessary to implement and monitor the remedy, into this permit.
4. Within 60 calendar days after this Permit has been modified in accordance with Permit Condition VII.E.3., the Permittee shall demonstrate financial assurance for completing the approved remedy, except for federal and state facilities.
5. The Permittee shall submit to the Department the CMI Plan for the SWMUs/AOCs listed in Table VII.6 for review and approval within 120 calendar days from the effective date of this permit.

VII.F. INTERIM MEASURES (IM)

1. IM Work Plan(s)
 - a. Upon notification by the Department, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC that the Department determines is necessary. IM are necessary in order to minimize or prevent further migration of contaminants and limit human and environmental exposure to contaminants while long-term corrective measures are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within 30 calendar days of such notification and shall include the elements listed in Permit Condition VII.F.1.b. Such IM may be conducted concurrently with investigations required under the terms of this permit. The Permittee may initiate IM by submitting an IM Work Plan for approval and reporting in accordance with the requirements under Permit Condition VII.F.
 - b. The IM Work Plan shall ensure that the IM are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include the IM objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.
 - c. The IM Work Plan must be approved by the Department in writing prior to implementation. The Department shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan.
 - d. The IM Report shall be reviewed by the Department in accordance with Permit Condition VII.G.
 - e. The Permittee shall submit IM WPs for the SWMUs and AOCs listed in Table VII.4 of this permit to the Department for review and approval. The IM WPs shall be submitted within 180 days from the effective date of this permit.
2. IM Implementation

- a. The Permittee shall implement the IM in accordance with the approved IM Work Plan.
- b. The Permittee shall give notice to the Department as soon as possible of any planned changes, reductions or additions to the IM Work Plan.
- c. Final approval of corrective action required under ADEM Admin. Code Rule 335-14-5-.06(12), which is achieved through IM, shall be in accordance with ADEM Admin. Code Rule 335-14-8-.04(2) and Permit Condition VII.E.

3. IM Reports

- a. If the time required for completion of IM is greater than one year, the Permittee shall provide the Department with Progress Reports at intervals specified in the approved work plan. The Progress Reports shall, at a minimum, contain the following information:
 - i. A description of the portion of the IM completed;
 - ii. Summaries of any deviations from the IM Work Plan during the reporting period;
 - iii. Summaries of any problems or potential problems encountered during the reporting period;
 - iv. Projected work for the next reporting period; and
 - v. Copies of laboratory or monitoring data.
- b. The Permittee shall prepare and submit the IM Report to the Department within 90 calendar days of completion of IM conducted under Permit Condition VII.F. The IM Report shall, at a minimum, contain the following information:
 - i. A description of IM implemented;
 - ii. Summaries of results;
 - iii. Summaries of all problems encountered;
 - iv. Summaries of accomplishments and/or effectiveness of IM; and
 - v. Copies of all relevant laboratory or monitoring data, etc., in accordance with Permit Condition I.C.10.

VII.G. SUBMITTALS

- 1. All work plans, reports, schedules, and other documents ("submittals") required by this permit shall be subject to approval by the Department to assure that such submittals and schedules are consistent with the requirements of this Permit and with applicable regulations and guidance. The Permittee shall revise all submittals and schedules as directed by the Department.

2. The Department will review all submittals in accordance with the conditions of this permit. The Department will notify the Permittee in writing of any submittal that is disapproved, and the basis therefore. If the Department disapproves a submittal, the Department shall (1) notify the Permittee in writing of the submittal's deficiencies and specify a due date for submission of a revised submittal, (2) revise the submittal and notify the Permittee of the revisions, or (3) conditionally approve the submittal and notify the Permittee of the conditions. Permit Condition VII.H. shall apply only to submittals that have been disapproved and revised by the Department, or that have been disapproved by the Department, then revised and resubmitted by the Permittee, and again disapproved by the Department.
3. All submittals shall be submitted within the time frame specified by the Department and in accordance with the approved schedule of compliance. Extensions of the due date for submittals may be granted by the Department based on the Permittee's demonstration that sufficient justification for the extension exists.
4. All submittals required by this permit shall be signed and certified in accordance with ADEM Admin. Code Rule 335-14-8-.02(2).
5. All submittals shall be provided by the Permittee in accordance with Permit Condition I.K.

VII.H. DISPUTE RESOLUTION

Notwithstanding any other provision in this permit, in the event the Permittee disagrees, in whole or in part, with the Department's revision of a submittal or disapproval of any revised submittal required by this Part, the following may, at the Permittee's discretion, apply:

1. In the event that the Permittee chooses to invoke the provisions of this section, the Permittee shall notify the Department in writing within 30 calendar days of receipt of the Department's revision of a submittal or disapproval of a revised submittal. Such notice shall set forth:
 - a. The specific matters in dispute;
 - b. The position the Permittee asserts should be adopted as consistent with the requirements of this permit;
 - c. The basis for the Permittee's position; and
 - d. Any matters considered necessary for the Department's determination.
2. The Department and the Permittee shall have an additional 30 calendar days from the Department's receipt of the notification provided for in Permit Condition VII.H.1. to meet or confer to resolve any disagreement.
3. In the event agreement is reached, the Permittee shall submit and implement the revised submittal in accordance with and within the time frame specified in such agreement.

4. If agreement is not reached within the 30-day period, the Department will notify the Permittee in writing of the decision on the dispute, and the Permittee shall comply with the terms and conditions of the Department's decision in the dispute. For the purposes of this provision in this permit, the responsibility for making this decision shall not be delegated below the Department's Land Division Chief.
5. With the exception of those conditions under dispute, the Permittee shall proceed to take any action required by those portions of the submission and of this permit that the Department determines are not affected by the dispute.

Table VII.1

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring a RCRA Facility Investigation (RFI):

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
Not Applicable (NA)	(NA)	NA	NA

Table VII.2

The following Solid Waste Management Unit (SWMU) and/or Area of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring no further action at this time:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
15B	Activated Carbon Treatment System	Unit manages leachate from Land Vault Nos. 1 & 2	NA
16	Container Storage Area	Unit closed with Incinerator #1	Soil, Groundwater
17	Rotary Kiln Incinerator #1	Unit closed in 1999	Air, Soil
18A-T	Rotary Kiln Incinerator #2	Unit Closed in 2006	Air, Soil
19	Tank Farm 1 (V-0700-07, V-1003)	Unit closed with Incinerator #1	Soil, Groundwater
20	Tank Farm 2 (V-1002, V-2499)	Unit closed with Incinerator #1	Soil, Groundwater
21	Tank Farm 3 (15-V-091, 15-V-092)	Unit closed with Incinerator #1	Soil, Groundwater
22A-E	Tank Farm 4 (15-V-202, 15-V-203, 15-V-204, 15-V-234, 15-V-205)	Unit closed with Incinerator #2	Soil, Groundwater
32	Warehouse No. 218	Unit managed pesticide residues and by-products	NA
34A-EE	Area 15 Waste Water Treatment System	Unit manages process unit waste waters, storm waters, and groundwater	NA
35A-C, F-M, O-R, T, V-BB	Main Wastewater Sumps	NA	NA
36	Air Curtain Incinerator (Area 15)	Unit managed wood pallets, wood construction debris, and wood generated from clearing	NA
37A	Former Underground Injection Well No. 1	Unit managed high salt content waste waters	NA

Table VII.2 Continued

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
37B	Former Underground Injection Well No. 2	Unit managed high salt content waste waters	NA
38A-C, L-N, Q, U, V, Z-CC*	≤90 day hazardous waste storage tanks, containers and areas	NA	NA
38D, E, J, K, O, P, R, S, T, W, X, Y	≤90 day hazardous waste storage tanks, containers and areas	Units are no longer in use	NA
39A-C, K-M, Q-R, T, V, W, DD, FF, GG, II, KK, SS, TT*	Satellite Accumulation Areas	NA	NA
39D-J, N-P, S, U, X-CC, HH, JJ	Closed Satellite Accumulation Areas	Units are no longer in use	NA
40A-D, F-H, K	Waste Loading Areas	NA	NA
41A-F, N-Z	Wastewater Trenches and Sumps	NA	NA
43A-F	Area 14 Waste Water Treatment System	Unit managed wastewaters from Area 14	NA
44A, C-E*	Used Oil Storage Areas	NA	NA
44B	Fire Station/Building 1010 Used Oil Storage Tank (6-V-1)	NA	NA
45A*	Universal Waste Area/Building 113	Unit manages universal wastes	NA
46	Non-hazardous Waste Storage Area/Building 212	Unit manages non-hazardous wastes	NA
47	Huntsman Environmental Areas	Unit manages various plant wastes	NA

* BASF should manage these <90 Day Hazardous Waste Storage Tanks, Containers, and Areas as required by Division 14 of the ADEM Administrative Code.

Table VII.3

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring action under other programs, such as CERCLA, etc.:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
23	Original Effluent impoundment	Remediated pursuant to CERCLA	Soil, Groundwater
24	Waste Disposal Pit	Remediated pursuant to CERCLA	Soil, Groundwater
25	Tar Disposal Area	Remediated pursuant to CERCLA	Soil, Groundwater
26	Waste Disposal Pits	Remediated pursuant to CERCLA	Soil, Groundwater
27	Open Burn Area	Remediated pursuant to CERCLA	Soil, Groundwater
28	Temporary Trash Staging Areas	Remediated pursuant to CERCLA	Soil, Groundwater
29	Disposal Site South of the Class C Landfill	Remediated pursuant to CERCLA	Soil, Groundwater
30	Bluffline Area	Remediated pursuant to CERCLA	Soil, Groundwater
31	BHC Burial Area	Remediated pursuant to CERCLA	Soil, Groundwater
33	Trash Staging Area	Remediated pursuant to CERCLA	Soil, Groundwater
AOC A	Dilute Ditch	Remediated pursuant to CERCLA	Sediment, surface water
AOC C	Floodplain	Remediated pursuant to CERCLA	Sediment, Surface water

Table VII.4

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring Interim Measures (IM) and/or Source Removal:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
NA	NA	NA	NA

Table VII.5

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs regulated by Parts I – VI, and IX of this permit:

SWMU/AOC NUMBER	SWMU/AOC NAME	POTENTIALLY AFFECTED MEDIA
1	Class C Landfill	Soil, Groundwater
2	Biological Sludge Landfill	Soil, Groundwater
3	Rectangular/ Triangular Pond	Soil, Groundwater
4	Sludge Impoundment # 1	Soil, Groundwater
5	Sludge Impoundment # 2	Soil, Groundwater
6	Sludge Impoundment # 3	Soil, Groundwater
7	Sludge Impoundment # 4	Soil, Groundwater
8	5-Day Impoundment	Soil, Groundwater
9	10-Day Impoundment	Soil, Groundwater
10	Equalization Impoundment	Soil, Groundwater
11	Dilute Impoundment	Soil, Groundwater
12	Diazinon Destruction Impoundment	Soil, Groundwater
13	GM-44 Impoundment	Soil, Groundwater
14	Aboveground Landvault #1	Soil, Groundwater
15A	Aboveground Landvault #2	Soil, Groundwater
AOC B*	Lower Dilute Ditch	Sediment, Surface Water

* BASF should inspect AOC B on a quarterly basis for integrity of the final cover, animal disturbance, and obstruction or impediment of drainage.

Table VII.6

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring a Corrective Measure Implementation (CMI) Plan¹:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
23	Original Effluent impoundment	Remediated pursuant to CERCLA	Soil, Groundwater
24	Waste Disposal Pit	Remediated pursuant to CERCLA	Soil, Groundwater
25	Tar Disposal Area	Remediated pursuant to CERCLA	Soil, Groundwater
26	Waste Disposal Pits	Remediated pursuant to CERCLA	Soil, Groundwater
27	Open Burn Area	Remediated pursuant to CERCLA	Soil, Groundwater
28	Temporary Trash Staging Areas	Remediated pursuant to CERCLA	Soil, Groundwater
29	Disposal Site South of the Class C Landfill	Remediated pursuant to CERCLA	Soil, Groundwater
30	Bluffline Area	Remediated pursuant to CERCLA	Soil, Groundwater
31	BHC Burial Area	Remediated pursuant to CERCLA	Soil, Groundwater
33	Trash Staging Area	Remediated pursuant to CERCLA	Soil, Groundwater
35D, N, S, U	Wastewater Sumps	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater

Table VII.6 Continued

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
35E*	BS-8, Main Wastewater Sump	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
38F, G, H, I	≤ 90 Day Hazardous Waste Storage Containers and Areas	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
39EE	Satellite Accumulation Area	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
40E*	Area 8 Waste Loading Pad	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
40I, J	Waste Loading Areas	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
41G, H, J	Wastewater Trenches and Sumps	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
41I, K-M*	Wastewater Trenches and Sumps	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
42A-E	Wastewater Treatment System	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
AOC A	Dilute Ditch	Remediated pursuant to CERCLA	Sediment, surface water
AOC C	Floodplain	Remediated pursuant to CERCLA	Sediment, Surface water

* SWMUs were removed during site demolition activities conducted during the spring and summer of 2016.

1. A Corrective Action Plan is currently being implemented for all SWMUs/AOCs in this table. See Part VIII of this Permit and Appendix L of the Permit Application for more information.

PART VIII

CORRECTIVE MEASURES IMPLEMENTATION

VIII.A. APPLICABILITY

The conditions of this Part apply to SWMUs and AOCs identified in Table VIII.1.

VIII.B. GENERAL CONDITIONS

1. The Permittee is required to perform corrective measures for the SWMUs and AOCs identified in Condition VIII.A. The approved remedy for these defined units, waterway areas, or land parcels, includes any and all actions set forth in this permit and in the approved Interim Measures Plans, Corrective Measures Studies (CMSs), and Corrective Measures Implementation (CMI) Plans approved by the Department, as noted in Table VIII.1.

2. Remedial Cleanup Levels

Upon approval, pursuant to Tables IX.3.A and IX.3.B of the permit and the CMI Plan designating applicable cleanup level(s), the cleanup level(s) for the areas specific to the CMI Plan will be deemed to be a condition of this permit.

3. Groundwater Monitoring and Remediation

Where required pursuant to Conditions VIII.B.1. and/or VIII.C. of this permit, the Permittee shall comply with the general groundwater monitoring requirements of Part IX of this permit.

4. Land Use Controls

Where required pursuant to Conditions VIII.B.1 and VIII.C of this permit, the Permittee shall establish appropriate land use controls to achieve protection of human health and the environment. The Permittee shall comply with Conditions VIII.B.5 and VIII.B.6 of this permit when implementing corrective measures requiring land use controls. In the event an off-site property owner does not allow an environmental covenant to be imposed, the Permittee shall notify the Department within 14 calendar days of receipt of such written notification of the refusal by the off-site property owner. If the property owner does not provide a written refusal of the request to allow an environmental covenant to be imposed, the Permittee shall notify the Department within 14 calendar days of delivery of the request to the off-site property owner. In such cases, the Department may allow the Permittee to propose an alternate area-specific land use control subject to the Department's review and approval.

5. Survey Plat

For corrective measures where residual concentrations of contaminants will remain in-place at levels greater than those appropriate for unrestricted land use, or for corrective measures that rely on land use controls, the Permittee must:

- a. Within 90 calendar days following the effective date of a permit modification addressing remedy selection, submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department, a survey plat indicating the location and dimensions of the SWMUs, AOCs, and capped or partially remediated areas with respect to permanently surveyed benchmarks, the locations of sampling points, and the concentrations of hazardous constituents detected. This plat must be prepared and certified by a professional land surveyor registered in the State of Alabama. The plat must be filed with the local zoning authority or the authority with jurisdiction over local land use and must contain a note, prominently displayed, which states the Permittee's obligation to limit the property to the specified restricted uses.
- b. Maintain the survey plat as described in Condition VIII.B.5.a. of this permit and in the Record of Decision(s) for OU-1, OU-2, OU-3, and OU-4 until the Permittee has demonstrated, to the satisfaction of the Department, that the levels of hazardous constituents in all contaminated media are within limits appropriate for unrestricted land uses.

6. Environmental Covenant

No later than the submission of the survey plat required in Condition VIII.B.5, the Permittee must:

- a. Record in the probate judges office of the county in which the property, or a portion thereof is located, an environmental covenant in accordance with ADEM Admin. Code Division 335-5 that will in perpetuity notify any potential purchaser of the property that:
 - i. The land is contaminated with hazardous constituents in concentrations that exceed unrestricted use standards;
 - ii. The use of the property is restricted by this permit for certain residential, municipal, or industrial purposes and may lead to an increased risk of exposure to hazardous constituents depending upon the activities initiated at the site. Such activities may yield an increased level of human health risk to the owner;
 - iii. The potential purchaser or entity that desires to work in the contaminated area should notify the Permittee before mobilizing to the area covered by the land use control.
- b. Submit to the Department a certification, signed by the Permittee in accordance with Permit Condition I.C.11. that the environmental covenant specified in this part has been performed. This certification must include a copy of the document in which the notation has been placed.
- c. Maintain the environmental covenant described in Permit Condition VIII.B.6. until the Permittee has demonstrated, to the satisfaction of the Department, that the levels of hazardous constituents in all contaminated media are within limits appropriate for unrestricted land uses.

7. Security

Security measures, where required by Conditions VIII.B.1 and/or VIII.C., of this permit, will be conducted in accordance with ADEM Admin. Code Rule 335-14-5-.02(5) and as prescribed in the approved CMI Plan.

8. Inspection

Where corrective measures addressed in Conditions VIII.B.1. include provisions to cap in place or partially remediate properties or land areas, whether owned or not owned by the Permittee, the Permittee shall specify inspection protocols on a scheduled basis to ensure continued integrity of the remedy and to ensure that land use remains appropriately restricted per the environmental covenant established pursuant to Permit Condition VIII.B.6. Inspection provisions shall be as prescribed in the approved CMI Plan.

VIII.C. AREA SPECIFIC CONDITIONS

The specific areas identified in this section have been designated by the US Environmental Protection Agency under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) program.

1. OU – 1: Contamination of the shallow (alluvial) groundwater aquifer.

a. Area Description

As defined in the 1989 ROD, contaminant plumes containing organics, such as solvents and production by-products, and inorganics, were identified in the part of BASF's Plant south of the developed areas, which include manufacturing and infrastructure facilities and waste management systems. The contaminant plumes were within BASF's south property boundary. Olin Corporation property adjoins BASF along the complete south property line. The alluvial aquifer begins at a nominal 50 feet below the land surface and extends to a depth of an additional nominal 50 feet.

b. Area Conditions

1. The Permittee shall maintain the groundwater extraction/treatment system described in Appendix L of the permit application and as required by Part IX of this permit.
2. The Permittee shall maintain all groundwater wells associated with the alluvial and Miocene aquifers monitoring program as described in Appendix L of the permit application and as required by Part IX of this permit.
3. The Permittee shall keep and maintain all monitoring, testing, and analytical data obtained in accordance with Permit Conditions IX.B., IX.C., IX.D., and IX.E. as required by Permit Condition I.C.10.
4. The Permittee shall continue to monitor and maintain records of the following parameters in addition to those outlined in Part IX of this permit.
 - a. System effluent volume,
 - b. Surface water discharge concentrations to the Tombigbee River; and

c. Corrective action well pumping rates.

2. OU -2: Contamination of soils at ten of eleven former waste management areas.

a. Area Description

Contamination of both surface and deeper soils was identified and characterized by the extensive site investigation which was performed according to CERCLA RI guidance. The facility property was investigated to locate all former waste management or waste impacted areas. The ten areas of contamination, which were collectively specified as OU-2, were generally east of the manufacturing portion of the plant. The predominant class of contaminants was commercial pesticides and the byproduct isomers and metabolites of these pesticide compounds. Contamination of the soil was the result of leaching from 10 hazardous waste management areas which included former waste storage piles, and in some cases, sub-surface disposal of solid waste materials.

The ten areas are described below:

1. SWMU 23 is a former wastewater impoundment currently filled-in with material from sandblasting activities. The waste at Area 1 was sludge containing pesticide residues, by-products, and intermediates from pesticide manufacturing.
2. SWMU 24 is a small, former disposal pit covered by fill located immediately east of Area 1. The pit contained wastes such as trash, pesticide residues, byproducts, and intermediates from pesticide manufacturing.
3. SWMU 25 is an area consisting of five discrete past waste management areas evidencing broad surficial contamination based on the field work conducted during the RI/FS. This unit was divided into five specific areas and a general area of contamination based on differences in color and type of the waste.
4. SWMU 26 consists of three isolated, shallow pits which are covered by clay fill. The pits contained pesticide residues and intermediates from pesticide manufacturing.
5. SWMU 27 is an area where open burning was formerly practiced. The area was covered by clay fill and contained trash, burned demolition debris, pesticide residues, byproducts, and intermediates from pesticide manufacturing.
6. SWMU 28 is the location of two adjacent former trash staging areas covered by clay fill. The site contained trash consisting of combustible refuse such as plastic, paper, cardboard, and rubber intermixed with manufactured pesticides and metals.
7. SWMU 29 is a former disposal pit covered with clay fill. The area contained drums, solid waste, jars, bulk solid wastes, and trash. The waste was comprised of pesticide residues, byproducts, and intermediates from pesticide manufacturing.
8. SWMU 31 is a chemical material burial area covered with clay fill. The area contained bulk pesticide byproducts, predominantly isomers of hexachlorocyclohexane (BHC), and residues.

9. SWMU 32 consists of a thin layer of waste partially covered by an existing storage warehouse. The area contained solid waste consisting of pesticide residues and byproducts. The waste was overlain by approximately eight feet of compacted clay fill. The ground surface is primarily covered with reinforced concrete.
10. SWMU 33 consists of intermixed soil and waste underlying the current trash staging area. The intermixed soil and waste consisted of pesticide byproducts and was overlain by approximately four feet of compacted clay fill. The surface is covered with reinforced concrete except for a small portion along the southern and eastern edges, which is bare ground.

b. Area Conditions

- i. The Permittee shall inspect the vegetated areas and maintain the established vegetated cover in such a manner to not allow any disturbance of the integrity of the final cover, liners, any components of the containment system, or the function of the facility's monitoring systems. The inspections shall specifically include evaluation of the following items:
 - a. Integrity of the final cover (erosion, ponding, subsidence, cracking, etc.);
 - b. Growth and stabilization of vegetative cover;
 - c. Run-on and run-off control system;
 - d. Groundwater monitoring wells; and
 - e. Survey benchmarks.
 - ii. Institutional controls for land use and groundwater use restrictions; inspections of areas quarterly and after storms as described in Appendix D of the permit application.
 - iii. The Permittee shall maintain the final cover system as described in the Final Remedial Design Report of OU – 2.
 - iv. The Permittee shall submit to the Department a written report which compiles the quarterly inspection reports. The report shall be submitted within 180 calendar days after the issuance of this permit and on an annual basis thereafter. Copies of this report shall be kept at the facility in accordance with Permit Conditions I.C.10.c. and I.C.10.e.
3. OU-3: Contamination within the floodplain, the floodplain drainage ditch (previously called the “lower portion of the dilute ditch” or the “effluent ditch”) and areas in the Tombigbee River within close proximity to the Site.

a. Area Description

Contamination of surface soil and sediment in the floodplain was characterized by the site investigation. OU-3 consists of the effluent ditch and 370 acres of the Tombigbee River floodplain and the adjacent areas in the Tombigbee River. This area is separated from the rest of the facility by the bluff line. The source of contamination was primarily from the effluent ditch and runoff from the waste management areas. Additional

characterization was performed in conjunction with the extensive ecological risk assessment phase preceding EPA's ROD, and during soil treatability studies conducted during the remedy evaluation phase. The principal contaminant of concern was DDT and its metabolites DDD and DDE (collectively known as DDTR).

b. Area Conditions

- i. The Permittee shall maintain the operation and maintenance requirements for the floodplain area described in ROD as well as the Final design report for OU-3.
- ii. The Permittee shall conduct annual fish sampling as described in most current version of the OU-3 Operation and Maintenance (O&M) plan, to evaluate the effectiveness of the remedial action completed in the area. At such time that the cleanup levels, as established in the OU-3 ROD, have been achieved and maintained for three consecutive years, the Permittee may request that the sampling frequency be reduced.
- iii. The Permittee shall inspect the sand capped areas and maintain the established cover in such a manner to not allow any disturbance of the integrity of the final cover. The inspections shall specifically include evaluation of the following items:
 - a. Integrity of the final cover (erosion, subsidence, scouring, cracking, etc.);
 - b. Sediment deposition/erosion at each station;
 - c. Survey benchmarks, where necessary.
- iv. The Permittee shall include information regarding the effectiveness of the OU-3 remedial action, which should include a compilation of the fish sampling results and cap inspections, annually.

4. OU-4: Contamination of soils in former waste management area designated as SWMU 30 (or bluff line area).

a. Area Description

Contamination of both surface and deeper soils was characterized by the site investigation. The bluff line area is located at the extreme east side of the BASF property, and is roughly bisected by an escarpment which separates the upland portion of the property from the floodplain of the Tombigbee River. An elevation change of approximately 45 feet occurs moving west to east across the site. The principal contaminants in the soil were pesticides, and additionally, commercial herbicides. Contamination of the soil resulted from past waste management practices such as open burning and solid waste disposal in subsurface pits.

b. Area Conditions

- i. The Permittee shall inspect the vegetated areas and maintain the established vegetated cover in such a manner to not allow any disturbance of the integrity of the final cover, liners, any components of the containment system, or the function of the facility's monitoring systems. The inspections shall specifically include evaluation of the following items:

- a. Integrity of the final cover (erosion, ponding, subsidence, cracking, etc.);
 - b. Growth and stabilization of vegetative cover;
 - c. Run-on and run-off control system;
 - d. Groundwater monitoring wells; and
 - e. Survey benchmarks.
- ii. Institutional controls for land use and groundwater use restrictions; inspections of areas quarterly and after storms as described in Appendix D.
 - iii. The Permittee shall maintain the slurry wall as described in the Final Remedial Design Report of OU-4.
 - iv. The Permittee shall include information regarding the effectiveness of the slurry wall in the written report described in Section VIII.C.2.b.iv of this permit.

VIII.D. CORRECTIVE MEASURES IMPLEMENTATION (CMI) REPORTS

1. CMI Progress Reports

If the time required to complete implementation of a specific set of corrective measures, as described in the Department-approved CMI Plan, is greater than 180 calendar days, the Permittee shall provide ADEM with progress reports according to the schedule in the ADEM-approved CMI Plan. If no schedule has been approved as part of the associated plan, progress reports shall be submitted at least quarterly. The progress reports shall, at a minimum, contain the following information:

- a. A description of the portion of CMI Plan completed;
- b. Summaries of and deviations from the approved CMI Plan during the reporting period;
- c. Summaries of current and potential problems, including recommended solutions and alternatives as well as corrective actions undertaken;
- d. Any monitoring data (soil, air, dust, water) collected for any reason during the construction period for the purposes of monitoring potential for human and ecological exposure; and
- e. Projected work for the next period and impacts to the approved schedule.

2. Final CMI Reports

Upon completion of construction of corrective measures systems, implementation of land use controls, interim removal actions, or other short-term activities required by this permit and/or the approved CMI Plan, the Permittee shall submit to the Department a Final CMI Report containing, at a minimum, the following:

- a. A description of activities completed;
- b. For cap and cover remedies, as-built construction drawings presenting the final in-place three-dimensional location of contaminated material. A plan view of the remediated areas shall be presented in addition to a cross section of the in-place capped areas;
- c. Waste manifests indicating the handling of any excavated material that has been shipped off-site to a Department approved, certified landfill;
- d. For remedies involving land use controls, a copy of the survey plat and environmental covenant required by Condition VIII.B. of this permit;
- e. Monitoring data (soil, air, dust, water) collected for any reason during the construction period for the purposes of monitoring potential for human and ecological exposure; and
- f. Certification, prepared in accordance with ADEM Admin. Code Rule 335-14-8-02 (2)(d) by the Permittee and an Alabama-registered Professional Engineer, that the corrective measures implementation phase (*i.e.*, construction) required by this permit is complete and that the approved system and/or facilities are ready for operation in accordance with the intended design (*i.e.*, CMI Plan).

3. Corrective Measures (CM) Effectiveness Reports

- a. For corrective measures that have been fully implemented and where the corrective measures system(s) must operate for a period of time to achieve cleanup goals or levels, the Permittee shall submit CM Effectiveness Reports (addressing all Corrective Measures systems at the facility which are subject to this permit condition) annually ,unless otherwise approved by the Department, beginning 180 calendar days following the Department's approval of the Final CMI Report for the initial Corrective Measures system subject to this permit condition. The overall CM Effectiveness Reports shall include, at a minimum, the following information for each SWMU and/or AOC included in the report:
 - i. A detailed narrative presenting an evaluation of the effectiveness of the selected remedy;
 - ii. Summaries of compliance with and progress toward achieving cleanup goals;
 - iii. Any significant revisions, adjustments, or proposed modifications to the selected remedy;
 - iv. Tabulated environmental sampling and monitoring data including, but not limited to, groundwater quality, elevation data, and a graphical representation of all constituents detected during each sampling event from recovery wells, monitoring wells, drinking water wells, and other locations;

- v. Chain of custody, field reports, and laboratory data sheets to include the date of collection, the date the sample was extracted, and the date of sample analysis for samples collected during the reporting period;
 - vi. Any monitoring data (soil, air, dust, water) collected for any reason during the post-construction period for the purposes of monitoring potential for human and ecological exposure;
 - vii. Isoconcentration maps depicting the distribution of parameters for each sampling event;
 - viii. Time versus concentration plots for each monitoring parameter for each recovery well and for each monitoring wells;
 - ix. Tabulated volumetric data on groundwater pumped and pumping rates (monthly and cumulative) for each recovery well;
 - x. Records of any groundwater recovery system operation time, including shutdown periods, not including any minor (less than 24 hours) shutdowns for repairs, maintenance, *etc.*;
 - xi. Potentiometric surface maps;
 - xii Description of land use during the reporting period at the designated area requiring corrective measures; and
 - xiii Findings of the Permittee's investigation into the continued effectiveness of land use controls per Condition VIII.B.
- b. If at any time the Permittee determines that any remedy selection specified in Condition VIII.B. or VIII.C. of this permit no longer satisfies the applicable requirements of ADEM Admin. Code Rule 335-14-5-.06(12) or this permit for releases of hazardous waste or hazardous constituents originating from SWMUs or AOCs, the Permittee must, within 90 calendar days, submit an application for a permit modification, pursuant to Permit Condition I.J., to make any appropriate changes to the CMI Plan.
 - c. The application for changes in the CMI Plan, including changes in inspection and monitoring provisions of the CMI Plan, shall be submitted as an application for a permit modification pursuant to the requirements of ADEM Admin. Code Rule 335-14-8-.04.

4. Final Report of Corrective Measures

Within 90 calendar days following attainment of cleanup levels or goals as outlined in this Permit and the approved CMI Plan, the Permittee shall submit to the Department a Final Report of Corrective Measures (FRCM). The FRCM shall contain a certification by the Permittee and an independent professional engineer registered in the State of Alabama that all remedial measures required by this permit and the approved CMI Plan have been completed. The FRCM shall outline any procedures and schedules for dismantling of corrective measures systems, groundwater monitoring or recovery

systems, removal of land use controls, and any other remedial systems or controls required by this permit or the approved CMI Plan.

Table VIII.1

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring Corrective Measures:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
23	Original Effluent impoundment	Remediated pursuant to CERCLA	Soil, Groundwater
24	Waste Disposal Pit	Remediated pursuant to CERCLA	Soil, Groundwater
25	Tar Disposal Area	Remediated pursuant to CERCLA	Soil, Groundwater
26	Waste Disposal Pits	Remediated pursuant to CERCLA	Soil, Groundwater
27	Open Burn Area	Remediated pursuant to CERCLA	Soil, Groundwater
28	Temporary Trash Staging Areas	Remediated pursuant to CERCLA	Soil, Groundwater
29	Disposal Site South of the Class C Landfill	Remediated pursuant to CERCLA	Soil, Groundwater
30	Bluffline Area	Remediated pursuant to CERCLA	Soil, Groundwater
31	BHC Burial Area	Remediated pursuant to CERCLA	Soil, Groundwater
33	Trash Staging Area	Remediated pursuant to CERCLA	Soil, Groundwater
35D, N, S, U	Wastewater Sumps	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater

Table VIII.1 Continued

35E*	BS-8, Main Wastewater Sump	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
38F, G, H, I	≤90 Day Hazardous Waste Storage Containers and Areas	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
39EE	Satellite Accumulation Area	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
40E*	Area 8 Waste Loading Pad	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
40I, J	Waste Loading Areas	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
41G, H, J	Wastewater Trenches and Sumps	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
41I, K-M*	Wastewater Trenches and Sumps	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
42A-E	Wastewater Treatment System	Remediation Plan for Former Production Areas 7 and 8	Soil, Groundwater
AOC A	Dilute Ditch	Remediated pursuant to CERCLA	Sediment, surface water
AOC C	Floodplain	Remediated pursuant to CERCLA	Sediment, Surface water

* SWMUs were removed during site demolition activities conducted during the spring and summer of 2016.

PART IX

GROUNDWATER MONITORING AND CORRECTIVE ACTION

IX.A. REQUIRED PROGRAM(S)

1. Groundwater monitoring shall consist of the General Groundwater Monitoring Program of Permit Condition IX.B., the Detection Monitoring Program contained in Permit Condition IX.C., the Compliance Monitoring Program contained in Permit Condition IX.D., and the Corrective Action Monitoring Program contained in Permit Condition IX.E.
2. The Permittee shall commence groundwater monitoring as required by this permit not later than 120 calendar days after the effective date of this permit.

IX.B. GENERAL GROUNDWATER MONITORING PROGRAM

1. Well Location, Installation and Construction

The Permittee shall install and/or maintain a groundwater monitoring system to comply with the requirements of ADEM Admin. Code Rules 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11) as applicable and as specified below:

- a. The Permittee shall maintain all groundwater monitoring wells at the facility as identified in Table IX.1. of this permit, at the locations specified on Figure L-1, Figure L-2a, and L-2b in Appendix L of the permit application and/or CMI Plan, and any other groundwater monitoring wells specified by Permit Condition IX.B.1.d. and IX.B.1.e.
 - i. All groundwater monitoring wells shall be maintained and inspected in accordance with the plans and specifications presented in Appendix L of the permit application and/or CMI Plan and in accordance with ADEM Admin. Code Rule 335-14-5-.06.
 - ii. A groundwater monitoring well shall not be removed from any monitoring program specified in this permit without an approved permit modification pursuant to Permit Condition I.J.
 - iii. If a groundwater monitoring well is damaged, the Permittee shall immediately notify the Department in writing, which includes a description of the well repair activities to be conducted. The well repair procedures must be approved by the Department prior to implementation. Within 30 calendar days after the well is repaired, the Permittee shall submit a written notification to the Department that the well repair activities were conducted in accordance with the approved procedures.
 - iv. If a groundwater monitoring well is deleted from the monitoring program(s) required by this permit in accordance with Permit Conditions IX.B.1.a. ii. and I.J., it shall be abandoned within 90 calendar days after deletion using procedures to be approved by the Department. Within 30 calendar days after the well is abandoned, the Permittee shall submit a

written notification to the Department that the well abandonment activities were conducted in accordance with the approved procedures.

- b. Groundwater monitoring wells OW-1, M-3, M-4, M-5, M-6, M-7, M-8, M-9, M-10, M-11, M-13, M-14, M-15, MD-2, MD-9, MD-11, MD-12 shall define the point of compliance for the entire facility, including all operating and closed units.
- c. The Permittee shall maintain groundwater monitoring well(s) MD-1, MD-5, M-1, M-2, and MW-12A as the background monitoring well(s) for the entire facility as specified in Appendix L of the permit application.
- d. The Permittee shall install and maintain additional groundwater monitoring wells as necessary to assess changes in the rate and extent of any plume of contamination or as otherwise deemed necessary to maintain compliance with ADEM Admin. Code Rules 335-14-5-.06(6), 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11), as applicable. A plan in the form of a permit modification request specifying the design, location and installation of any additional monitoring wells should be submitted to the Department at least 90 calendar days prior to installation which, at a minimum, shall include:
 - i. Well construction techniques including casing depths and proposed total depth of well(s);
 - ii. Well development method(s);
 - iii. A complete description of well construction materials;
 - iv. A schedule of implementation for construction; and,
 - v. Provisions for determining the lithologic characteristics, hydraulic conductivity, grain size distribution, and porosity for the applicable aquifer unit(s) at the location of the new well(s).
- e. The Permittee shall restart recovery well PW-5 and install recovery wells PW-11S, PW-12, PW-13, and the 3 to 5 Miocene clay sand lens monitoring wells within 90 days of the effective date of this permit. The construction and location will follow the specifications shown in the Permit Mod request dated, January 31, 2025. After the installation of these wells is completed, and within 120 calendar days after the effective date of this permit, the Permittee shall submit a report to the Department that includes the surveyed location and elevation, surveyed elevation reference point, total depth, screened interval, well log, and other pertinent information for each well installed. All location and elevation data shall be surveyed by a professional surveyor licensed in the State of Alabama. Elevation data shall be recorded and reported as mean sea level (MSL) and referenced to an appropriate national geodetic vertical datum (NGVD) benchmark. Location data shall include latitude and longitude. The report shall be accompanied by a request for a minor permit modification in accordance with ADEM Admin Code Rule 335-14-8-.04(3) and Permit Condition I.J
- f. Reserved

2. General Groundwater Monitoring Requirements

- a. The Permittee shall determine the groundwater surface elevation from all monitoring wells listed in Table IX.1. of this permit at least semi-annually and each time a sampling event is conducted. The results of these determinations should be submitted in accordance with Permit Condition IX.B.6. Elevation data should be recorded and reported as mean sea level (MSL) and referenced to an appropriate national geodetic vertical datum (NGVD) benchmark.
- b. The Permittee shall determine the groundwater flow rate and direction in the underlying aquifer(s) at least annually and submit the results in accordance with Permit Condition IX.B.6.
- c. The Permittee shall determine background concentrations of hazardous constituents and other chemical parameters required to be monitored by this permit in accordance with Appendix L of the permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(g).

3. Groundwater Protection Standard

- a. The groundwater protection standard, as required under ADEM Admin. Code Rule 335-14-5-.06(3), shall consist of Table IX.3.A and Table IX.3.B of this permit which lists the hazardous constituents and their respective concentration limits.
- b. The groundwater protection standard applies to all hazardous waste or hazardous constituent releases as deemed appropriate by the Department to protect human health and the environment.

4. Compliance Period

- a. The compliance period, during which the groundwater protection standard specified in Permit Condition IX.B.3. applies, shall begin at the time of the first sampling event of the compliance monitoring program (Permit Condition IX.D.), or the corrective action monitoring program (Permit Condition IX.E.), whichever is earlier.
- b. The compliance period shall continue (after beginning pursuant to Permit Condition IX.B.4.a.) until the groundwater protection standard as defined by Permit Condition IX.B.3.a. has not been exceeded for a period of three consecutive years.
- c. If the Permittee is engaged in a corrective action program pursuant to Permit Condition IX.E., then the compliance period shall continue as required by ADEM Admin. Code Rule 335-14-5-.06(7)(c) until the groundwater protection standard has not been exceeded for a period of three consecutive years after corrective action has been terminated and this permit has been modified, in accordance with Permit Condition I.J., to implement a compliance monitoring program pursuant to Permit Condition IX.D. or a detection monitoring program pursuant to Permit Condition IX.C., as required by ADEM Admin. Code Rule 335-14-5-.06(11)(f).

5. 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 Permit Condition IX.B.1. to provide a reliable indication of the quality of the groundwater as required under ADEM Admin. Code Rules 335-14-5-.06(8)(d), (e), and (g):

- a. Samples shall be collected, preserved, and shipped (when shipped off-site for analysis) in accordance with the procedures specified in Appendix B and Appendix L of the permit application.
- b. Samples shall be analyzed according to the procedures specified in Appendix B and Appendix L of the permit application, the most recent edition of SW-846 or other appropriate methods approved by the Department. Analytical method detection limits shall be less than or equal to the groundwater protection standards specified in Table IX.3.A. or IX.3.B., unless otherwise approved in writing by the Department.
- c. Samples shall be tracked and controlled using the chain-of-custody procedures specified in Appendix B and Appendix L of the permit application.
- d. Statistical analyses used to evaluate the groundwater monitoring data shall be as described in Appendix L of the permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(h).
- e. All samples taken in accordance with this permit shall not be filtered prior to analysis.

6. Recordkeeping and Reporting

- a. The Permittee shall keep and maintain all monitoring, testing, and analytical data obtained in accordance with Permit Conditions IX.B., IX.C., IX.D., and IX.E. as required by Permit Condition I.C.10.
- b. The Permittee shall submit to the Department a written report to include all analytical sampling data, established background values, statistical evaluations, groundwater elevations, associated potentiometric maps, and the annual groundwater flow rate and direction determinations. The analytical method and the method detection limit (MDL) for each constituent must be integrated into all reports of analysis. The report shall be submitted within 60 calendar days after the first sampling event and on an annual basis thereafter. Copies of this report shall be kept at the facility in accordance with Permit Conditions I.C.10.c and I.C.10.e.
- c. The Permittee shall submit progress reports to the Department describing implementation of groundwater monitoring and/or corrective action activities at the site as required by Part IX of this permit on a quarterly basis. The first progress report shall be submitted to the Department within 90 calendar days after the effective date of this permit. The progress reports shall continue until such time as the required monitoring and/or corrective action systems and

activities required by this permit are fully constructed and operational. In the event that additional monitoring and/or corrective action requirements are imposed through a permit modification, in accordance with Permit Condition I.J., the quarterly reporting requirement shall resume, commencing upon the effective date of the permit modification and continuing until the required monitoring and/or corrective action systems and activities are again fully constructed and operational.

IX.C. DETECTION MONITORING PROGRAM (Reserved)

IX.D. COMPLIANCE MONITORING PROGRAM (Reserved)

IX.E. CORRECTIVE ACTION MONITORING PROGRAM

The requirements of this Condition are applicable to the entire facility. Except as specified otherwise in this permit, the Corrective Action Monitoring Program shall be implemented in accordance with Appendix L of the permit application and ADEM Admin. Code Rule 335-14-5-.06(11).

1. Monitoring Systems

In addition to the point of compliance and background well monitoring systems identified in Permit Conditions IX.B.1.b. and IX.B.1.c., the Permittee shall:

- a. Maintain groundwater monitoring wells MD-3B, MD-6, MD-7, and MD-8 as boundary wells for the entire facility as specified in Table IX.1. of this permit and as shown on Figure L-1, Figure L-2a, and L-2b in Appendix L of the permit application.
- b. Maintain groundwater monitoring wells CA-4A, OW-2, OW-4, OW-6, M-12, MW-9A, MW-10A, MD-4, and the new Miocene clay sand lens wells as effectiveness wells as specified in Table IX.1. of this permit and as shown on Figure L-1, Figure L-2a, and L-2b in Appendix L of the permit application.
- c. Maintain wells PW-1, PW-2, PW-3, PW-5, PW-6, PW-7, PW-8, PW-9, PW-10, PW-11S, PW-12, and PW-13 as recovery wells and PW-11 as an Interim Action Recovery Well (IA-RCY) as specified in Table IX.1. of this permit and as shown on Figure L-1, Figure L-2a, and L-2b in Appendix L of the permit application.
- d. Maintain wells CA-1, CA-2, and CA-3 as corrective action wells as specified in Table IX.1. of this permit and as shown on Figure L-1, Figure L-2a, and L-2b in Appendix L of the permit application

2. Corrective Action Program

- a. The Permittee shall conduct a Corrective Action Program, as described in Appendix L of the permit application, to remove or treat in place all hazardous

constituents that exceed their respective groundwater protection standards as described in Table IX.3.A and Table IX.3.B of this permit at the point of compliance, between the point of compliance and the down-gradient facility property boundary, and beyond the facility boundary in accordance with ADEM Admin. Code Rule 335-14-5-.06(11)(e).

- b. Pursuant to ADEM Admin. Code Rules 335-14-5-.06(11)(c) and 335-14-5-.06(11)(e)3., the Permittee shall continue to implement the corrective action program as described in Appendix L of the permit application within 120 calendar days after the effective date of this permit.
- c. The Permittee shall handle/treat groundwater in accordance with Appendix L of the permit application and with the applicable requirements of NPDES permit number AL0003093, as issued by the Department.

3. Monitoring Requirements

In addition to the general groundwater monitoring requirements specified in Permit Condition IX.B.2., the Permittee shall:

- a. Sample all background, point of compliance and effectiveness monitoring wells shown in Table IX.1. of this permit and analyze for the constituents listed in Table IX.2. of this permit on a semi-annual basis beginning within 120 calendar days of the effective date of this permit and continuing through the end of the compliance period.
- b. Sample all background, point of compliance, effectiveness, and boundary monitoring wells shown in Table IX.1. of this permit and analyze for the constituents listed in Table IX.3.A and Table IX.3.B of this permit on an annual basis beginning within 120 calendar days of the effective date of this permit and continuing through the end of the compliance period.
- c. Sample all background, point of compliance, effectiveness, and boundary monitoring wells shown in Table IX.1. of this permit and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard units) each time the well is sampled. The data obtained should be submitted as raw data in the reports required by Permit Condition IX.B.6.
- d. When evaluating the monitoring results to determine the effectiveness of the corrective measures, in accordance with Permit Condition IX.E.4., the Permittee shall:
 - i. Determine if the corrective action system effectively addresses the entire plume of contamination;
 - ii. Determine if the concentration of the hazardous constituents are decreasing (pH increasing or decreasing toward neutrality, as applicable) in the effectiveness wells specified in Permit Condition IX.E.1.;

- iii. Determine if hazardous waste or hazardous constituents are being released into the environment; and
- iv. Determine if hazardous constituents have been detected in the boundary wells specified in Permit Condition IX.E.1.

4. Reporting and Response Requirements

In addition to the recordkeeping and reporting requirements specified in Permit Condition IX.B.6.:

- a. The Permittee shall report the effectiveness of the corrective action program annually, as required under ADEM Admin. Code Rule 335-14-5-.06(11)(g). These reports shall be submitted to the Department within 60 calendar days of each annual anniversary of this permit after corrective action is initiated and continue until corrective action is completed. The Permittee must provide data from groundwater monitoring along with an analysis of that data and any conclusions regarding the effectiveness of the program in accordance with Permit Condition IX.E.3.d. If the analysis of the data warrants any change to the corrective action program, the Permittee must include these revisions in the annual report which will be followed up within 90 calendar days with an application for permit modification in accordance with Permit Condition I.J.
- b. If corrective action is terminated under Permit Condition IX.B.4.c., the Permittee must sample all background, point of compliance, effectiveness and boundary sampling locations for the compounds listed in ADEM Admin. Code Rule 335-14-5-Appendix IX. Based upon the sampling results, the Permittee may petition the Department, in accordance with Permit Condition I.J, for a permit modification to implement either a detection monitoring program or a compliance monitoring program.

TABLE IX.1.
MONITORING WELL DESIGNATIONS

WELL NUMBER	WELL TYPE *	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP-OF-RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. MSL)	MONITORED ZONE
M-1	BKG	31° 17.236'	088° 00.531'	Entire Facility	76.5	55.65	42.62	29.66/40.34	Alluvial
M-2	BKG	31° 17.230'	087° 59.789'	Entire Facility	69.5	36.75	39.08	29.66/40.34	Alluvial
M-3	POC	31° 16.514'	087° 59.879'	Entire Facility	74.0	42.7	44.95	19.42/-43.82	Alluvial
M-4	POC	31° 16.523'	087° 59.680'	Entire Facility	57.0	28.95	29.73	24.71/-19.29	Alluvial
M-5	POC	31° 16.525'	087° 59.593'	Entire Facility	60.0	31.00	33.60	22.68/-21.32	Alluvial
M-6	POC	31° 16.537'	087° 59.383'	Entire Facility	61.0	36.55	38.38	21.26/-23.74	Alluvial
M-7	POC	31° 16.615'	087° 59.264'	Entire Facility	75.0	52.55	54.63	33.20/-16.80	Alluvial
M-8	POC	31° 16.666'	087° 59.228'	Entire Facility	80.0	52.15	52.91	32.80/5.56/ -6.20/-32.20	Alluvial
M-9	POC	31° 16.698'	087° 59 075'	Entire Facility	85.0	35.35	37.50	11.98/-42.62	Alluvial
MW-9A	EFF	31° 16.491'	087° 59.729'	Entire Facility	58.05	26.75	29.98	12.22/-28.25	Alluvial
M-10	POC	31° 16.785'	087° 58.994'	Entire Facility	89.0	33.48	35.42	14.94/-26.04/ - 31.04/-52.04	Alluvial
MW-10A	EFF	31°16.486'	087° 59.511'	Entire Facility	54.80	30.15	32.88	18.32/-22.15	Alluvial
M-11	POC	31° 16.956'	087° 58.999'	Entire Facility	69.0	27.00	28.44	18.22/-52.86	Alluvial
M-12	EFF	31° 16.479'	087° 59.361'	Entire Facility	60.0	41.60	43.81	14.23/-12.79	Alluvial
MW-12A	BKG	31° 17.243'	087° 59.306"	Entire Facility	75.25	31.65	34.43	47.65/22.60/ 12.55/2.83	Alluvial
M-13	POC	31°16.998'	087° 59.043'	Entire Facility	68.74	29.05	31.10	56.89/2.04	Alluvial
M-14	POC	31° 17.110'	087° 59 050'	Entire Facility	56.55	27.45	30.42	48.03/3.23	Alluvial
M-15	POC	31° 17.202'	087° 59.042'	Entire Facility	53.80	28.05	31.31	43.66/3.90	Alluvial
OW-1	POC	31° 16.491'	088° 00.206'	Entire Facility	77.24	53.95	56.71	38.90/-21.10	Alluvial
OW-2	EFF	31° 16.442'	088° 00.142'	Entire Facility	85.66	51.60	52.58	28.89/-33.11	Alluvial
OW-4	EFF	31° 16.444'	088° 00.017'	Entire Facility	76.93	48.45	50.17	32.41/-27.59	Alluvial
OW-6	EFF	31° 16.392'	087° 59.741'	Entire Facility	7308	33.65	34.27	22.01/-22.99	Alluvial
CA-1	CAM	31° 16.249'	088° 00.076'	Entire Facility	88.54	49.90	53.69	17.8/-37.2	Alluvial
CA-2	CAM	31° 16.261'	087° 59.701'	Entire Facility	60.72	32.55	33.18	22.4/-27.6	Alluvial
CA-3	CAM	31° 16.377'	087° 59.431'	Entire Facility	55.61	35.15	37.74	20.9/-19.1	Alluvial
CA-4A	EFF	31° 16.512'	087° 59.194'	Entire Facility	53.42	14.30	17.49	4.21/-35.79	Alluvial
PW-1	RCY	31° 16.487'	087° 59.344'	Entire Facility	58.73	44.15	45.81	13.3/-11.9	Alluvial
PW-2	RCY	31° 16.474'	087° 59.556'	Entire Facility	56.64	30.75	32.59	17.2/-23.9	Alluvial
PW-3	RCY	31° 16.391'	087° 59.773'	Entire Facility	68.55	39.05	40.99	18.2/-26.8	Alluvial
PW-6	RCY	31° 16.370'	088° 00.075'	Entire Facility	95.33	48.45	50.42	20.8/-44.13	Alluvial
PW-5**	RCY	-	-	Entire Facility	-	-	-	-	Alluvial
PW-7	RCY	31° 16.396'	088° 00.099'	Entire Facility	84.12	50.15	52.41	25.7/-36.24	Alluvial
PW-8	RCY	31° 16.382'	088° 00.265'	Entire Facility	94.0	52.25	53.60	24.9/-40.99	Alluvial
PW-9	RCY	31° 16.550'	087° 59.317'	Entire Facility	62.93	43.65	45.48	9.7/-19.5	Alluvial
PW-10^	RCY	31° 16.429'	087° 59.758'	Entire Facility	63.05	41.15	43.47	31.15/-18.85	Alluvial
PW-11	IA-RCY	31° 16.611'	087° 59.206'	Entire Facility	91.73	34.50	36.29	-30/-55	Lower Alluvial
PW-11S**	RCY	-	-	Entire Facility	-	-	-	-	Upper Alluvial
PW-12**	RCY	-	-	Entire Facility	-	-	-	-	Lower Alluvial
PW-13**	RCY	-	-	Entire Facility	-	-	-	-	Alluvial
XX**	EFF	-	-	Entire Facility	-	-	-	-	Miocene Clay Sand Lens
MD-1	BKG	31° 17.241'	088° 00.533'	Entire Facility	247.0	40.45	41.49	-186.15/-206.15	Miocene
MD-2	POC	31° 16.538'	087° 59.381'	Entire Facility	160.0	36.50	38.05	-99.15/-119.15	Miocene
MD-3B	BDY	31° 16.257'	088° 00.320'	Entire Facility	220.0	41.37	44.01	-158.631/-178.63	Miocene
MD-4	EFF	31° 16.712'	087° 59.061'	Entire Facility	159.28	34.40	36.81	-76.10/-114.74	Miocene
MD-5	BKG	31° 17.038'	087° 59.363'	Entire Facility	177	39.79	42.31	-122.21/-137.21	Miocene
MD-6	BDY	31° 16.262'	087° 59.702'	Entire Facility	197.25	32.64	34.92	-149.61/-164.61	Miocene
MD-7	BDY	31° 16.240'	087° 59.456'	Entire Facility	160	32.79	35.61	-107.21/-127.21	Miocene
MD-8	BDY	31° 16.454'	087° 59.794'	Entire Facility	235	42.46	42.26	-215/-235	Miocene
MD-9	POC	31° 16.45'	087° 59.516'	Entire Facility	160	27.45	29.76	-112.55/-132	Miocene
MD-11	POC	31° 16.520'	087° 59.204'	Entire Facility	111	16.52	20.72	-65.94/-85.94	Miocene
MD-12	POC	31° 16.553'	087° 59.243'	Entire Facility	135	19.3	22.43	-95.8/-115.8	Miocene
MD-13	Offsite	31° 16.104'	087° 59.729'	Entire Facility	285	30.52	33.00	-199.48/-219.48	Miocene
MD-14	Offsite	31° 16.107'	087° 59.917'	Entire Facility	300	42.74	45.44	-156.77/-176.77	Miocene

* Well Type:

POC – Point of Compliance Wells (M-5, M-8, M-9, M-10, M-11, M-13, M-14, M-15 & OW-1 are monitored semi-annually for depth to groundwater data only).

EFF – Effectiveness Monitoring Wells

PGM – Piezometers and/or General Monitoring Wells

BKG – Background Wells (one BG well is sampled each year for each Aquifer on an annual rotation basis)

BDY – Boundary Monitoring Wells

RCY – Recovery Wells (excluding backup well PW-10) IA-RCY – Interim Action Recovery Well PW-11

CAM – Corrective Action Monitoring Wells

Offsite – Offsite Miocene Monitoring Wells

^PW10 was shutdown on October 15, 2014 and now is used as a backup well when PW-3 is down for maintenance

** New Miocene clay sand lens wells and recovery wells PW-11S, PW-12, and PW-13 will be installed in accordance with Permit Condition IX.B.1.e. PW-5 will be reactivated.

TABLE IX.2

GROUNDWATER QUALITY MONITORING CONSTITUENTS*

HAZARDOUS CONSTITUENT	ZONE
Alpha-BHC	Alluvial
Benzene	Alluvial, Upper Miocene
Beta-BHC	Alluvial
Carbon Tetrachloride	Alluvial
Chlorobenzene	Alluvial, Upper Miocene
Delta-BHC	Alluvial

* The constituents listed herein are the subset of the Groundwater Protection Standard listed in Tables IX.3.A and IX.3.B for which monitoring is required and are analyzed semi-annually.

TABLE IX.3.A (Alluvial Aquifer)
GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	CONCENTRATION LIMIT (mg/L)
Alpha-BHC	0.0000072*
Arsenic	0.01
Benzene	0.005
Beta-BHC	0.000025*
Bis (2-Ethylhexyl) phthalate**	0.006
Carbon Tetrachloride	0.005
Chlorobenzene	0.1
Chloroform**	0.08
2-Chlorophenol	0.0091*
Chlorobenzilate**	0.00031*
Cobalt**	0.0006*
4,4-DDD	0.000032*
4,4 DDE	0.000046*
4,4-DDT	0.00023*
Delta-BHC	MDL
1,4 – Dichlorobenzene	0.075
1,1 - Dichloroethylene	0.007
1,2 - Diphenylhydrazine	0.000078*
Lead**	0.015
Lindane**	0.0002
Naphthalene	0.00012*
Nitrobenzene	0.00014*
1,2,4-Trimethylbenzene	0.0056*
Vanadium (Total)	0.0086*
Vinyl chloride	0.002

* Values are Tapwater values from the EPA Regional Screening Levels table. All other values are MCLs unless otherwise noted.

** Identifies the parameter(s) which are to be analyzed every five years; all other parameters are analyzed annually.

TABLE IX.3.B (Miocene Aquifer)
GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	CONCENTRATION LIMIT (mg/L)
Alpha-BHC	0.0000072*
Arsenic**	0.01
Benzene	0.005
Beta-BHC	0.000025*
Bis (2-Ethylhexyl) phthalate**	0.006
Carbon Tetrachloride	0.005
Chlorobenzene	0.1
Chloroform**	0.08
Chlorobenzilate**	0.00031*
4,4-DDD	0.000032*
4,4 DDE	0.000046*
4,4-DDT	0.00023*
Delta-BHC	MDL
1,4 – Dichlorobenzene**	0.075
1,2-Diphenylhydrazine	0.000078*
Lindane**	0.0002
Naphthalene	0.00012*
Strontium (Total)**	1.2*
Vanadium (Total)	0.0086*

* Values are Tapwater values from the EPA Regional Screening Levels table. All other values are MCLs unless otherwise noted.

** Identifies the parameter(s) which are to be analyzed every five years; all other parameters are analyzed annually.

PART X

SUMMARY OF DEADLINES

The summary information provided herein is intended only as a guide to the requirements of this permit. It is not intended to be all inclusive, nor is it intended to be used as a substitute for the full text of this permit.

PERMIT CONDITION	ITEM	DUE DATE
I.C.2.	Reapply for a renewal.	180 calendar days before the expiration of the current permit.
I.C.12.a.	Give notice to the Department of any planned physical alterations or additions to the permitted facility and any solid waste management units.	As soon as possible
I.C.12.f.	Report any noncompliance with this permit that may endanger human health or the environment.	Orally within 24 hours from the time the Permittee becomes aware of the circumstances. Written submission shall also be provided within 5 calendar days of the time that the Permittee becomes aware of the circumstances.
I.C.13	Submit the certification of construction.	Before the Permittee may commence treatment, storage or disposal of hazardous waste or contaminated media at any new or modified portion of the facility
I.G.	Waste Minimization Certification	Annually
I.H.	Update cost estimates.	Annually, as required by ADEM Admin. Code Rules 335-14-5-.08(3)(b), 335-14-5-.08(5)(b), and 335-14-5-.08(10)(b) and no later than 30 calendar days after the Department has approved a modification to the Closure Plan, Post-Closure Plan, or Corrective Action Plan, or any other plan required or referenced by this permit, if the change in the plan results in an increase in the amount of the cost estimate.
I.J.	Submit a written request for a permit modification pursuant to the requirements of ADEM Admin. Code Rule 335-14-8-.04(2).	At least 60 calendar days prior to a proposed change in facility design or operation.

PERMIT CONDITION	ITEM	DUE DATE
V.M.	Submit reports of all data collected pursuant to Permit conditions V.D.4.a and V.D.4.e, the total tonnage, by major waste category of waste disposed each calendar month of the preceding year, and for the first annual report only, the tabulated results of all leachate analyses conducted during the preceding year.	60 days after the first anniversary of the effective date of the Permit, and annually thereafter.
VI.B.8	Submit reports of all data collected pursuant to Permit conditions VI.B.5.a, VI.B.5.d., VI.B.7, and for the first annual report only, the tabulated results of all leachate analyses conducted during the preceding year.	60 days after the first anniversary of the effective date of the Permit, and annually thereafter.
VII.B.1.	Notify the Department, in writing, of the discovery of any additional AOCs.	Within 15 calendar days of discovery.
VII.B.2.	Notify the Department, in writing, of the discovery of any additional SWMUs.	Within 15 calendar days of discovery.
VII.B.3.	Submit a SWMU Assessment Report (SAR) for each SWMU identified under VII.B.2.	Within 90 calendar days of notification.
VII.C.1.	Notify the Department, in writing, of any newly discovered release(s) of hazardous waste or hazardous constituents from SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means.	Within 15 calendar days of discovery.
VII.D.7.	Submit RFI progress reports.	Monthly basis beginning in the second month following the initiation of the RFI.
VII.D.8	Submit RFI Report.	Within 60 calendar days from the completion of investigation activities.

PERMIT CONDITION	ITEM	DUE DATE
VII.E.2	Submit CMI Plan.	Within 120 calendar days following the Permittee's submittal of the RFI Report indicating that hazardous constituents have come to be located at any area of the Permittee's facility, or beyond the facility, at concentrations exceeding those appropriate for the protection of human health and the environment, or within 120 calendar days following notification from the Department that a CMI Plan is required, whichever occurs earlier.
VII.E.4.	Demonstrate financial assurance for completing the approved remedy.	Within 60 calendar days after this Permit has been approved.
VII.F.1.	Submit IM Work Plan.	Within 30 calendar days upon notification by the Department.
VII.F.3.	Submit IM Report.	Within 90 calendar days of completion of IM.
VIII.B.5.a.	Submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department, a survey plat indicating the location and dimensions of the SWMUs, AOCs, and capped or partially remediated areas with respect to permanently surveyed benchmarks, the locations of sampling points, and the concentrations of hazardous constituents detected.	Within 90 calendar days following the effective date of a permit modification addressing remedy selection.
VIII.B.6.a.	Record environmental covenant.	No later than the submission of the survey plat required in Condition VIII.B.5.
VIII.B.6.b.	Submit to the Department a certification that the environmental covenant has been performed.	No later than the submission of the plat required in Condition VIII.B.5.
VIII.D.3.	Begin Submitting Corrective Measures Effectiveness Reports	Annually beginning 180 calendar days following the Department's approval of the Final CMI Report.
VIII.D.4.	Submit a Final Report of Corrective Measures (FRCM).	Within 90 calendar days following attainment of cleanup levels or goals.

PERMIT CONDITION	ITEM	DUE DATE
IX.B.1.a.iii.	Notification of damaged groundwater monitoring wells.	Immediately notify the Department in writing, which includes a description of the well repair activities to be conducted. The well repair procedures must be approved by the Department prior to implementation. A repair report must be submitted within 30 calendar days of repair.
IX.B.1.d.	Install additional groundwater monitoring wells.	As necessary to assess changes in the rate and extent of any plume of contamination, or as otherwise deemed necessary. Note: a permit modification request must be submitted at least 90 calendar days prior to installation of additional groundwater monitoring well(s).
IX.B.2.a.	Determine groundwater surface elevation.	At least semi-annually and each time a well is sampled.
IX.B.2.b.	Determine groundwater flow rate and direction.	At least annually.
IX.B.6.b.	Submit groundwater monitoring report.	Within 60 calendar days of the first sampling event and annually thereafter.
IX.B.6.c.	Submit progress reports.	Within 90 calendar days after the effective date of this permit and quarterly thereafter. See permit condition for start/stop/resume provisions.
IX.E.2.b.	Implement corrective action plan	No later than 120 calendar days after the effective date of this permit.
IX.E.3.a.	Sample all background, point of compliance wells and effectiveness wells and analyze for the constituents listed in Table IX.2. of this permit.	Semi-annually beginning within 120 calendar days of the effective date of this permit.
IX.E.3.b.	Sample all background, point of compliance wells, effectiveness, and boundary wells and analyze for the constituents listed in Table IX.3.A and Table IX.3.B of this permit.	Annually beginning within 120 calendar days of the effective date of this permit.
IX.E.3.c.	Sample and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard units), at all background and point of compliance monitoring well locations.	Each time the well is sampled.
IX.E.4.a.	Submit corrective action effectiveness reports.	Annually within 60 calendar days of each annual anniversary of this permit after corrective action is initiated and until corrective action is completed.

January 31, 2025

Via E-Mail: austin.pierce@adem.alabama.gov

Austin R. Pierce, Chief
Alabama Department of Environmental Management
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

**Subject: Request for RCRA Permit Modification
BASF Corporation, McIntosh, Washington County, Alabama
USEPA I.D. Number ALD 001 221 902**

Dear Mr. Pierce:

In compliance with your December 3, 2024 approval letter to the August 21, 2024 *Data Report: Additional Vertical Aquifer Sampling (VAS) Investigations of Alluvial and Miocene Aquifer Groundwater*, your December 20, 2024 extension request response letter, and Section I.J of the December 2023 RCRA Permit for the BASF McIntosh facility, this is a request for a RCRA permit modification to add groundwater extraction wells and new groundwater monitoring wells to the Alluvial Aquifer pump and treat network.

Attachment A provides a plan detailing the proposed siting and design of additional Alluvial Aquifer extraction wells in the bluffline and uplands areas, including:

- Bluffline area Upper Alluvial Aquifer extraction well PW-11S, which would be located near existing Interim Action well PW-11.
- Bluffline area Lower Alluvial Aquifer extraction well PW-12, which would be located near existing Lower Alluvial Aquifer monitoring well TPZ-6.
- Uplands area extraction well PW-13, which would be located on the southwest side of the South Stormwater Collection Tank.

In addition, BASF proposes to reactivate existing Uplands Area extraction well PW-5, which has been idle since November 3, 2011 (in accordance with the October 2011 RCRA permit).

Attachment B provides a plan detailing proposed additional investigations of the Miocene Clay Sand Lens (MCSL) discovered in the western uplands during the 2024 VAS investigations. The proposed additional investigations include the installation of 3 to 5 new groundwater monitoring wells within the MCSL, as follows:

- Based on the findings from the 2024 VAS investigations, two of the proposed new MCSL monitoring wells would be located near existing Alluvial Aquifer monitoring wells OW-11 and SW-3.
- The remaining 1 to 3 new MCSL monitoring wells would be located based on the findings from the proposed additional investigations described in **Attachment B**.

If you have any questions concerning this request, or require more information, please call me at 914-557-6009.

Sincerely,
BASF

A handwritten signature in black ink, appearing to read "SH Havlik", written in a cursive style.

Stephen Havlik
Senior Remediation Specialist

Attachment A: LimnoTech, January 2025. Work Plan for Additional Alluvial Aquifer Extraction Wells, (Bluffline & Upland Areas)

Attachment B: LimnoTech, January 2025 Work Plan for Miocene Clay Sand Lens Investigations (Western Upland Area)

cc/via email: ADEM: Ben King, Robert Stanley, Jennifer McCord
US EPA Region 4: Beth Walden

ATTACHMENT A
LimnoTech, January 2025
Work Plan for Additional Alluvial Aquifer Extraction Wells
(Bluffline & Upland Areas)
for the BASF McIntosh, AL Site (ALD 001 221 902)

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Work Plan for Additional Alluvial Aquifer Extraction Wells (Bluffline & Upland Areas)

for the BASF McIntosh, AL Site (ALD 001 221 902)

Prepared for:
BASF

January 2025

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**Work Plan for Additional Alluvial Aquifer Extraction Wells
(Bluffline & Upland Areas)
BASF McIntosh, AL Site
(ALD 001 221 902)**

January 2025

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1 Introduction

The BASF McIntosh Site ("the Site", RCRA Permit number ALD 001 221 902) is located in McIntosh, Alabama, approximately 50 miles north of Mobile, Alabama ([Figure 1](#)). The BASF Corporation (BASF) acquired Ciba Specialty Chemicals Corporation in 2009 and is the current owner of the Site. This Work Plan describes proposed activities to expand, and provide redundancy to, the existing Alluvial Aquifer groundwater extraction system, which has been operating at the site since 1987 in accordance with Resource Conservation and Recovery Act (RCRA) permitting requirements per Alabama Department of Environmental Management (ADEM) regulatory oversight.

Groundwater quality has been monitored at the McIntosh facility since 1981, consistent with RCRA mandates. A Corrective Action Plan (CAP) was developed and implemented in 1985, as specified under 40 CFR 264.100 and ADEM Admin. Code R 335-14-5-.06(11), "*Releases for Solid Waste Management Units*", when contaminants were identified in the uppermost (i.e., Alluvial) aquifer. The CAP subsequently was included in the RCRA Permit issued in October 1985. The Plan has been the basis for Corrective Action required by the regulations and has been revised, as required, to address on-going evaluations of effectiveness. Details of the sampling program are provided in Appendix L of the RCRA Permit ("*Groundwater Corrective Action Program*", updated December 2023). The CAP addresses the contamination identified in the uppermost (Alluvial) aquifer and the underlying (Upper Miocene) aquifer separately, to protect human health and the environment through preventing the migration of contaminants to receptors and controlling the sources of releases to the aquifer.

As shown in [Figure 2](#), the existing Alluvial Aquifer groundwater extraction and collection system provides hydraulic containment of impacted Upper Alluvial Aquifer groundwater in the Uplands area. The current system consists of 8 active extraction wells (PW-1, PW-2, PW-3, PW-6, PW-7, PW-8, PW-9 and backup well PW-10) and a slurry wall located in the bluffline area that was designed to direct Alluvial Aquifer groundwater towards PW-9, located at the extreme eastern end of the groundwater collection system. Extraction wells PW-4 and PW-5 were idled in January 2012 and November 2011, respectively. Two areas of the site are the focus of ongoing phased field activities and supplemental Corrective Actions (conducted 2018 through 2024) and where additional Alluvial Aquifer groundwater extraction wells are proposed (refer to [Figure 3](#)):

- **Floodplain/Bluffline area** where Alluvial Aquifer groundwater impacts are bypassing the western end of the slurry wall. Phased field activities have provided data for the design and siting of two bluffline extraction wells (PW-11S and PW-12) to address impacts in the upper and lower portions of the Alluvial Aquifer, respectively, that are not being captured by the existing groundwater extraction well/slurry wall Corrective Action system (refer to bluffline area Upper and Lower Alluvial Aquifer groundwater elevation map in [Figure 4](#)).



- **The western upland area** of the site where chlorobenzene impacts at extraction well PW-7 have been detected above Groundwater Protection Standards (GWPS) since the well became operational in 1987. PW-7 accounts for over 95% of chlorobenzene mass removal by the groundwater extraction system, which averages approximately 2,000 pounds per year. Extent and distribution investigations conducted in 2023 and 2024 support the siting and design of a new Alluvial Aquifer extraction well (PW-13, located north of the PW-7/PW-8 corridor and adjacent to the south storm Water Tank). For additional extraction system redundancy, BASF proposes to restart existing extraction well PW-5, which has been idled since November 2011.

The August 2024 Data Report that documented the most recent phased investigation results (LimnoTech, August 2024) was approved by ADEM on December 3, 2024. The AEM approval letter stated the following (ADEM, 3 December 2024):

- *“The data gathered appears to be sufficient to move forward with the design and siting of new Alluvial extraction wells near the bluffline and in the western uplands”*
- *“A plan detailing the proposed siting and design of the new Alluvial extraction wells in both the area near the bluffline and the western uplands should be submitted within 30 days of receipt of this letter”.*

On December 19, 2024, BASF requested ADEM approval for an extension of the Work Plan deadline to February 3, 2025 (BASF, 19 December 2024), which ADEM approved on December 20, 2024 (ADEM, 20 December 2024).

The remainder of this Work Plan describes the activities associated with expanding the Alluvial Aquifer groundwater extraction system in the bluffline area (Section 2) and providing extraction system redundancy in the Upland area (Section 3). Surveying and investigation derived waste (IDW) management activities are described in Section 4. References are provided in Section 5.



2 Expansion of Groundwater Extraction System in Bluffline/Floodplain Area

Historical groundwater quality data from bluffline/floodplain Effectiveness monitoring well CA-4A, and recent groundwater quality data collected from test borings SB23-PW12TEST (LimnoTech, September 13, 2023), SB24-PW-11S and SB24-TPZ10 (LimnoTech, August 2024), and other nearby monitoring wells, show that by-pass of impacted upper and lower Alluvial Aquifer groundwater is occurring at the western end of the Bluffline slurry wall. Specifically, recent groundwater quality data indicate that impacted upper Alluvial Aquifer groundwater that is being diverted towards the west by the slurry wall is not being captured by extraction well PW-9, possibly because of declining PW-9 well efficiency since the well began operations in July 1987. Although PW-11 was installed on the bluffline in June 2019 to address bypass of lower Alluvial Aquifer impacts, the yield from PW-11 has been deemed too low to reverse groundwater flow at CA-4A. Consequently, two new groundwater extraction wells are proposed to address upper and lower Alluvial Aquifer impacts that are bypassing the western end of the slurry wall. As discussed in greater detail below, sufficient data has been collected to expedite extraction well design and installations, and monitoring will be conducted for evaluation of future extraction well performance and seasonal variability.

Historical groundwater data are available from Alluvial Aquifer monitoring wells positioned along the eastern side of the slurry wall and eastern floodplain area, and these data indicate that bypass is not occurring around the eastern end of the slurry wall. In addition, Miocene Aquifer impacts detected in Bluffline Point-of-Compliance wells MD-2, MD-11 and MD-12 are not addressed specifically in this Work Plan because the Miocene Aquifer chlorobenzene plume has been stable and is not migrating offsite at concentrations above the 0.100 mg/l GWPS. Addressing by-pass of Alluvial Aquifer impacts around the western end of the slurry wall is of immediate concern in this first phase of supplemental bluffline Corrective Actions. Additional bluffline area source investigations may be proposed as part of future phased work, pending the results of future performance monitoring data.

2.1 Proposed Design and Installation of Bluffline Upper Alluvial Aquifer Extraction Well PW-11S

The 2018-2019 CPT/HPT/MIP and well construction data collected for Lower Alluvial well PW-11 along with the 2024 soil and groundwater data collected from test borings SB24-PW11S and SB24-TPZ10 have been used to site the location and develop the design for an Upper Alluvial Aquifer extraction well in the bluffline area (refer to [Figure 5](#)). The SB24-PW11S and SB24-TPZ10 locations were selected for additional Upper Alluvial Aquifer soil and groundwater sampling in 2024 because of their year-around accessibility and to confirm the extent of groundwater impacts and thickness of the impacted Upper Alluvial sand interval. The 2024 sampling results showed that Upper Alluvial groundwater is impacted at both locations with chlorobenzene concentrations well above the 0.100 mg/l Groundwater Protection Standard (GWPS), but that the sand interval is thicker and likely better yielding at the SB24-PW-11S location (LimnoTech, August 2024). Consequently, a shallow Alluvial Aquifer extraction well (PW-11S) is



proposed adjacent to existing Lower Alluvial Aquifer well PW-11. The boring log and grain size data for boring SB24-PW-11S are provided in [Appendices A and B](#), respectively.

Figure 6 shows the proposed design of Upper Alluvial Aquifer extraction well PW-11S, which will be situated within 10 ft of existing inactive Lower Alluvial Aquifer well PW-11 and include the following design elements:

- A minimum 14-inch inner diameter Schedule 80 PCV surface casing installed from grade to approximately 36 ft below grade into native fine-grained soils, within a minimum 18-inch diameter borehole (not to exceed 20 inches). The annulus between the borehole and surface casing would be grouted to grade and allowed to cure for at least 24 hours before proceeding with the following well installation activities.
- 8-inch diameter PVC casing installed to 44 ft below grade within a minimum 14-inch diameter borehole.
- 8-inch diameter, 12 ft long, 10-slot PVC well screen installed from 44 to 56 ft below grade across the Upper Alluvial Aquifer sand interval.
- Centralizers will be used to properly position the well screen and casing within the borehole.
- 2-ft of plugged casing below the well screen to serve as a collection sump for fines, installed from 56 to 58 ft below grade.
- Appropriately sized sand pack that will be installed from total boring depth (approximately 60 ft below grade) to a minimum of 4 ft above the top of the well screen (approximately 42 ft below grade).
- A minimum of 4 ft of bentonite seal above the top of the sand pack.
- Approximately 36 ft of bentonite-cement grout seal between the 8-inch diameter inner well casing and the 14-inch diameter surface casing.
- A concrete pillar at the surface (approximately 2 to 3 ft above grade) that will support the inner well casing riser, discharge line and other downhole equipment.

As shown in **Figure 6**, the well screen for PW-11S will be situated above the screened interval at inactive Lower Alluvial Aquifer well PW-11. Groundwater elevation data from these clustered wells will provide vertical groundwater gradient information between the hydraulically separate Upper and Lower Alluvial Aquifer intervals.

At least 24 hours after the well has been installed as described above, PW-11S will be properly developed and tested to determine Specific Yield for sizing the pump and discharge line. BASF will solicit bids from qualified vendors for engineering design of the discharge line, system conveyance and controls. The well discharge is expected to be routed directly to the site WWTP but may be integrated with the existing discharge line for PW-9 depending on vendor recommendations.

PW-11S is expected to be operated as depicted in **Figure 6** so that impacted groundwater in surrounding Upper Alluvial Aquifer monitoring wells is within the PW-11S capture zone, while at the same time



minimizing drawdown in PW-11S. Iron fouling can be minimized or potentially avoided if groundwater levels in PW-11S are kept no lower than the top of the well screen during extraction operations. Section 4 provides additional information on the performance monitoring system that will be used to evaluate the extent of the PW-11S capture zone and assist well operations.

2.2 Proposed Design and Installation of Bluffline Lower Alluvial Aquifer Extraction Well PW-12 Near Existing TPZ-6 Monitoring Well Location.

The May 2023 soil and groundwater data collected from test boring SB23-PW12TEST were used to develop a preliminary design for a lower Alluvial Aquifer well that was proposed to be installed within the corridor defined by the SB23-PW12TEST location and just east of TPZ-6 (refer to [Figure 5](#)). The SB23-PW12TEST location was initially selected because it is situated at the seasonal high-water limit on the access road leading into the floodplain area. If the lower Alluvial Aquifer extraction well is installed east of the SB23-PW12TEST location (i.e., in the floodplain), an engineered access will need to be constructed because the topography drops off and the area becomes inundated during seasonal high flood stage.

Despite its location in the floodplain, recent re-evaluations of the hydrogeologic and 1999 pumping test data for existing monitoring well TPZ-6 show that this location is a better candidate than the SB23-PW12TEST location for a Lower Alluvial Aquifer extraction well, for the following reasons:

- Based on available historical geological information, the corridor off and above the western end of the slurry wall generally marks the northernmost zone where sufficient lower Alluvial Aquifer sands have been documented above the western end of the slurry wall. Further north, lower Alluvial Aquifer sands become more interfingering, thinner, finer-grained and lower yielding, such as those encountered at the PW-11 location. At the SB23-PW12TEST location, the Lower Alluvial Aquifer sands are present, but they are fine-grained and not as thick as those documented at the TPZ-6 location (refer to SB23-PW12TEST and TPZ-6 boring logs in [Appendix A](#) and SB23-PW-12TEST grain size data in [Appendix B](#)). Consequently, the Lower Alluvial Aquifer sands at the SB23-PW12TEST boring location are not expected to yield as well as those already documented at the TPZ-6 well.
- A 44-hour, 40 gpm constant rate pumping test was conducted in lower Alluvial Aquifer well TPZ-6 (ERM, March 2000). The results showed that TPZ-6 (a 4-inch diameter well) could sustain this flow rate with a maximum drawdown of 30.55 ft. In addition, the groundwater levels in APW-1 and CA-4A (located 675 ft and 400 ft from TPZ-6, respectively) dropped by 0.96 ft and 2.77 ft, respectively, during the test. These data indicate that a lower Alluvial Aquifer extraction well in this location could yield at least 40 gpm without excessive drawdown, and that an extraction well near TPZ-6 would capture CA-4A groundwater impacts.
- During the 1999 TPZ-6 constant rate pumping test, the groundwater level in TPZ-6 did not drop below the top of the well screen. Alluvial Aquifer groundwater has high dissolved iron concentrations, which precipitates quickly when exposed air, resulting in iron fouling problems in wells at the site. The 1999 TPZ-6 pumping test data show that a larger diameter extraction well located near TPZ-6 could be pumped continuously at ≥ 40 gpm without exposing the well



screen to air, which is favorable for minimizing iron fouling in the well and thus reducing OMM costs.

Figure 7 shows the proposed design of Lower Alluvial Aquifer extraction well PW-12, which will be situated within 10 ft of Lower Alluvial Aquifer monitoring well TPZ-6 and include the following design elements:

- A minimum 14-inch inner diameter Stainless Steel combination surface/outer protective casing would be installed from at least 8 feet below grade to approximately 15 ft above the floodplain, based on a maximum expected flood elevation of 22 ft NGVD. This would be installed in sections, with the lowest section (i.e., surface casing) installed first to at least 8 ft below grade. The remainder of the protective outer casing would be threaded or welded onto the lower surface casing section after the extraction well is drilled and installed.
- 8-inch diameter, 20 ft long, 10-slot Schedule 80 PVC well screen installed from 40 to 60 ft below grade across the Lower Alluvial Aquifer sand interval.
- Centralizers will be used to properly position the well screen and casing within the borehole.
- 3-ft of plugged casing below the well screen to serve as a collection sump for fines, installed from 60 to 63 ft below grade.
- Appropriately sized sand pack that will be installed from total boring depth (approximately 60 ft below grade) to a minimum of 4 ft above the top of the well screen (approximately 36 ft below grade).
- A minimum of 4 ft of bentonite seal above the top of the sand pack (up to approximately 32 ft below grade).
- Approximately 47 ft of bentonite-cement grout seal between the remainder of the 8-inch diameter inner well casing and the 14-inch ID surface/protective casing (that will be extended to approximately 15 ft above the floodplain after being welded or threaded onto the lowest surface casing section).
- Based on design recommendations from qualified vendors and estimated costs, an elevated ramp or tower will be built so that the PW-12 extraction well can be accessed all year. The nearest perennially dry access road leads to the TPZ-10 monitoring well location, which is situated approximately 140 ft north of TPZ-6 at an elevation of approximately 26 ft NGVD. An elevated access ramp can be built from the TPZ-10 location to PW-12, or a tower can be built around the PW-12 extraction well so that it can be accessed by boat during flood stage.

At least 24 hours after the well has been installed as described above, PW-12 will be properly developed and tested to determine Specific Yield for sizing the pump and discharge line. Based on the 1999 TPZ-6 constant rate pumping test, PW-12 is expected to yield at least 40 gpm following development

BASF will solicit bids from qualified vendors for engineering design of the elevated access ramp or tower, discharge line, system conveyance and controls. The well discharge is expected to be routed directly to



the site WWTP but may be integrated with the existing discharge line for PW-11S or PW-9 depending on vendor recommendations.

New extraction well PW-12 is expected to be operated as depicted in [Figure 7](#) so that impacted groundwater in surrounding Lower Alluvial Aquifer monitoring wells is within the PW-12 capture zone, while at the same time minimizing drawdown in PW-12. Iron fouling can be minimized or potentially avoided if groundwater levels in PW-12 are kept no lower than the top of the well screen during extraction operations. Section 4 provides additional information on the performance monitoring system that will be used to evaluate the extent of the PW-12 capture zone and assist operations.

2.3 Continuous Groundwater Level Monitoring of Bluffline Area Alluvial Aquifer

Ongoing continuous monitoring of bluffline area groundwater levels in select wells will be conducted to support performance monitoring of the proposed new bluffline extraction wells described above.

Continuous groundwater level monitoring is being conducted in a network of Upper and Lower bluffline/floodplain Alluvial Aquifer wells, as described in the subsections below.

2.3.1 Real-time continuous monitoring of Upper Alluvial Aquifer in Bluffline Area

Continuous data collection of groundwater levels has been conducted since April 2023 in four existing bluffline area monitoring wells that are screened in the upper portion of the Alluvial Aquifer (PZ-10, TPZ-10, TPZ-12 and TPZ-15, refer to [Figure 8](#)). These wells are equipped with pressure transducers (Level Troll 500 sensors) to collect seasonal real-time background groundwater level data and to support future performance evaluations of proposed new bluffline upper Alluvial Aquifer extraction well PW-11S. All sensors will be maintained for at least one full calendar year following the installation and startup of the new upper Alluvial Aquifer extraction well to assess its influence on upper Alluvial Aquifer groundwater levels.

2.3.2 Real-time continuous monitoring of Lower Alluvial Aquifer in Bluffline Area

Real-time data collection of groundwater levels has been conducted in select bluffline area Alluvial Aquifer monitoring wells since September 2021. These wells include TPZ-4, TPZ-6, TPZ-7, TPZ-11, CA-4A, PZ-1 and PZ-16 (refer to [Figure 8](#)), which are screened primarily in the lower portion of the Alluvial Aquifer. These wells were equipped with pressure transducers (Level Troll 500 sensors) to collect seasonal real-time groundwater level data to support performance evaluations of bluffline Alluvial Aquifer extraction well PW-11, which was installed in June 2019. PW-11 was equipped with a Level Troll 500 sensor in April 2023. These wells will be used to support performance evaluations of proposed bluffline Lower Alluvial Aquifer extraction well PW-12. All sensors will be maintained for at least one full calendar year following the installation and startup of the Lower Alluvial Aquifer extraction well PW-12 to assess its performance and influence on lower Alluvial Aquifer groundwater levels.



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3 Expansion of Uplands Area Alluvial Aquifer Groundwater Extraction System for System Redundancy

In 2024, four test boring locations were installed and characterized north and northwest (i.e., upgradient) of extraction wells PW-7 and PW-8 to assess the geology, vertical distribution and relative concentrations of groundwater impacts in the Alluvial Aquifer in support of the design of redundancy to the existing groundwater extraction system (see SB24-01A through SB24-04A boring locations on [Figure 9](#)). Chlorobenzene was detected above the 0.1 mg/l GWPS at the two westernmost locations SB24-03A and SB24-04A, and BHC pesticides were detected above GWPS at all four locations (LimnoTech, August 2024). [Figure 10](#) shows that the highest chlorobenzene concentrations were detected in the Alluvial Aquifer groundwater sample that was collected just above the Miocene Clay at the SB24-04A location, which is situated on the southwest side of the South Storm Water Tank and northeast of PW-7. In addition, the GWPS for 1,4-dichlorobenzene, benzene and carbon tetrachloride were exceeded in Alluvial Aquifer groundwater samples collected from at the SB24-04A location.

As explained in the following subsections, BASF proposes to install a new extraction well near the SB24-04A location and restart existing extraction well PW-5 (which has been idled since November 2011) to provide Alluvial Aquifer extraction system redundancy.

3.1 Installation of New Alluvial Aquifer Extraction Well PW-13 Near South Storm Water Tank

[Figure 11](#) shows the proposed design of new Alluvial Aquifer extraction well PW-13, which will be situated within 10 ft of the SB24-04A boring location and include the following design elements:

- 14-inch inner diameter Schedule 80 PCV surface casing installed from grade to approximately 30 ft below grade into native fine-grained soils, within a minimum 18-inch diameter borehole (not to exceed 20 inches). The annulus between the borehole and surface casing would be grouted to grade and allowed to cure for at least 24 hours before proceeding with the following well installation activities
- 8-inch diameter PVC casing installed to 74 ft below grade, within a minimum 14-inch diameter borehole (not to exceed 16 inches).
- 8-inch diameter, 12 ft long, 15-slot PVC well screen, installed from 74 to 86 ft below grade at the bottom of the Alluvial Aquifer interval. The lower 12 ft of the Alluvial Aquifer interval is being screened to target the coarsest sand and gravel interval and where the highest chlorobenzene impacts were detected. To minimize iron fouling, this design also will allow the well to be pumped at a rate that will maximize drawdown while maintaining the groundwater level above the top of the screen.



- Centralizers will be used to properly position the well screen and casing within the borehole.
- 2-ft of plugged casing below the well screen to serve as a collection sump for fines, installed from 86 to 88 ft below grade.
- Appropriately sized sand pack that will be installed from total boring depth (approximately 88 ft below grade) to a minimum of 4 ft above the top of the well screen (approximately 70 ft below grade).
- At least 4 ft of bentonite seal above the top of the sand pack, approximately 66 to 70 ft below grade.
- Approximately 66 ft of bentonite-cement grout above the bentonite seal layer to grade, installed between the 8-inch diameter inner well casing and the 14-inch ID surface casing.
- A concrete pillar at the surface (approximately 2 to 4 ft above grade) that will support the inner well casing riser, discharge line and other downhole equipment.

PW-13 will be properly developed and tested following installation to determine Specific Yield for sizing the pump and discharge line. BASF will solicit bids from qualified vendors for engineering design of the discharge line, system conveyance and controls. Pending vendor recommendations, the PW-13 discharge likely will be integrated with the existing main discharge line for the current extraction system, which is routed to the site WWTP.

PW-13 is expected to be operated to minimize drawdown in PW-13. Iron fouling can be minimized or potentially avoided if groundwater levels in PW-13 are kept no lower than the top of the well screen during extraction operations.

3.2 Proposed Re-Activation of Idled Existing Extraction Well PW-5

As shown in [Figure 9](#), PW-5 is located approximately 875 ft east-northeast of PW-7 and approximately 660 ft southeast/downgradient of the easternmost boring that was installed and sampled in 2024 (i.e., SB24-01A). Following an ADEM-approved 10-day temporary shutdown test in November 2010, and in accordance with the updated October 5, 2011 RCRA permit, PW-5 and PW-4 were shutdown on November 3, 2011 and January 3, 2012, respectively (BASF, November 3, 2010; ADEM, November 4, 2010; LimnoTech, December 15, 2010; ADEM, October 5, 2011). The two former extraction wells were shutdown because their combined flow represented less than 10% of the total extraction system flow at the time, and because their combined chlorobenzene mass removal rate was less than 0.4 pounds/year (refer to [Figure 12](#)). For the ten years prior their shutdowns, chlorobenzene concentrations in groundwater samples collected from PW-4 and PW-5 did not exceed 0.010 mg/l.

As shown in [Figure 13](#), the PW-4 and PW-5 shutdowns have not resulted in a loss of hydraulic containment. Historical groundwater elevation data have demonstrated that the current Alluvial Aquifer groundwater extraction and collection system has consistently provided hydraulic containment in the uplands area. Although chlorobenzene is by far the primary constituent of concern with respect to mass removal, PW-5 did have exceedances of the GWPSs for arsenic, carbon tetrachloride, A-BHC, B-BHC, D-BHC, 1,2-diphenylhydrazine and nitrobenzene at the time of the November 3, 2011 shutdown. For this



reason, and because pesticides were detected above GWPS in the 2024 Alluvial Aquifer groundwater samples from upgradient borings SB24-01A and SB24-02A, BASF proposes to restart PW-5 for additional extraction system redundancy.

A well construction diagram for PW-5 is provided in [Figure 14](#). PW-5 will be redeveloped and treated for iron fouling prior to installing a new pump and motor. The original 1985 constant rate pumping test showed a Specific Capacity (Sc) of 19.5 gpm yield per foot of drawdown for PW-5 when it was pumped at a constant rate of 250 gpm; however, this initial Sc value is likely too high due to a loss of well efficiency over the past 40 years since PW-5 was installed. Based on its performance for the years prior to its shutdown in late 2011, PW-5 is expected to yield up to 90 gpm during constant rate pumping without excessive drawdown.

PW-5 will be connected to the existing former discharge line and conveyance system after a new pump and motor are installed.



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4 Surveying and Management of Investigation Derived Waste (IDW)

Following the completion of well installation activities, the location coordinates and top of casing reference for groundwater level monitoring at each extraction well will be surveyed by a licensed surveyor. Horizontal coordinates will be in State Plane NAD83 Alabama West Zone. Vertical coordinates will be based upon NAVD88 and GEIOD18.

All purged groundwater and decontamination water will be drummed for proper disposal at the onsite wastewater treatment plant.

Soil cuttings will be drummed and a composite soil sample will be collected from each boring location for TCLP analyses. Soil waste will be properly disposed pending the results of the TCLP analyses.



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Figure 1. BASF site map

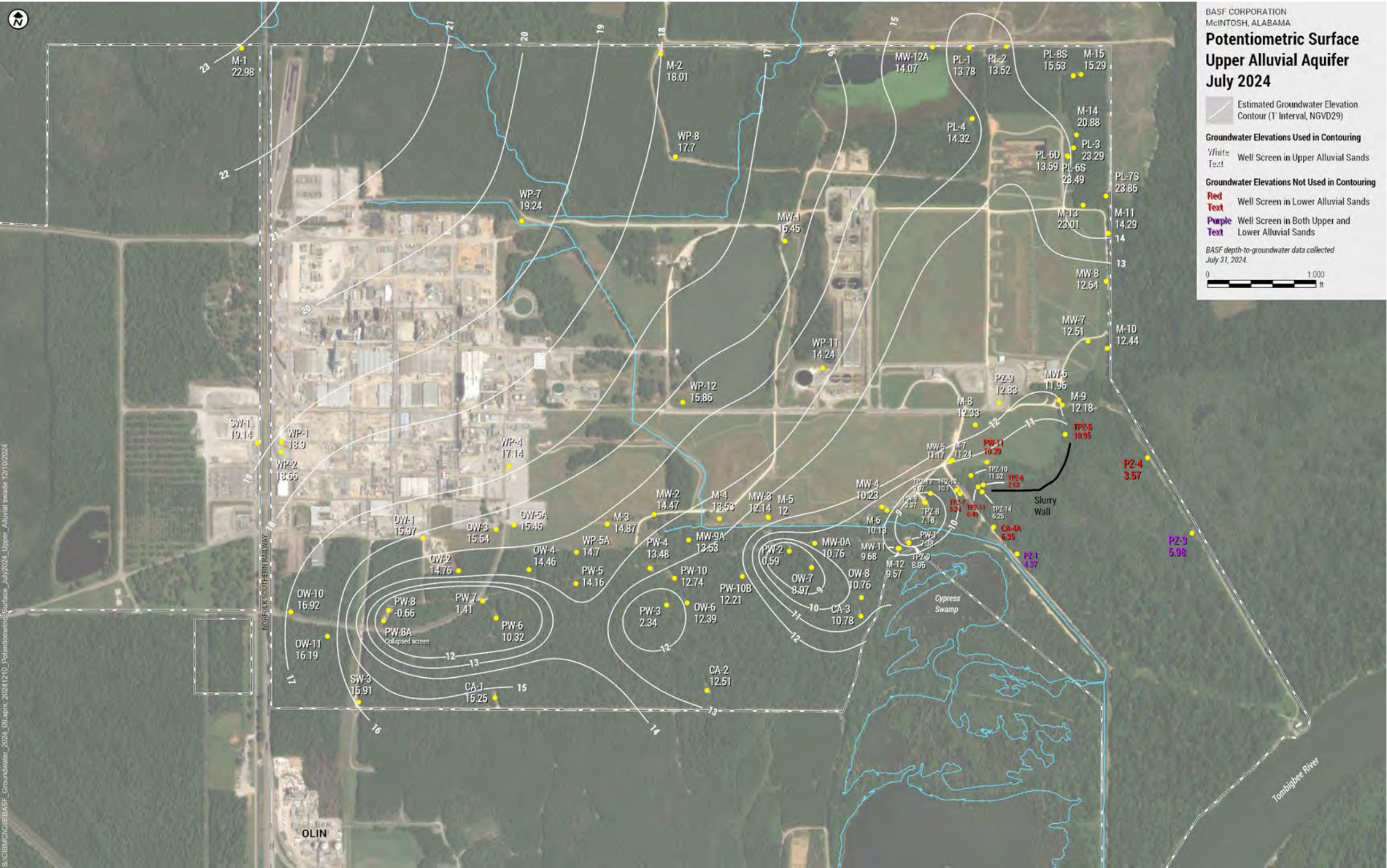


Figure 2. July 2024 Upper Alluvial Aquifer potentiometric surface map.

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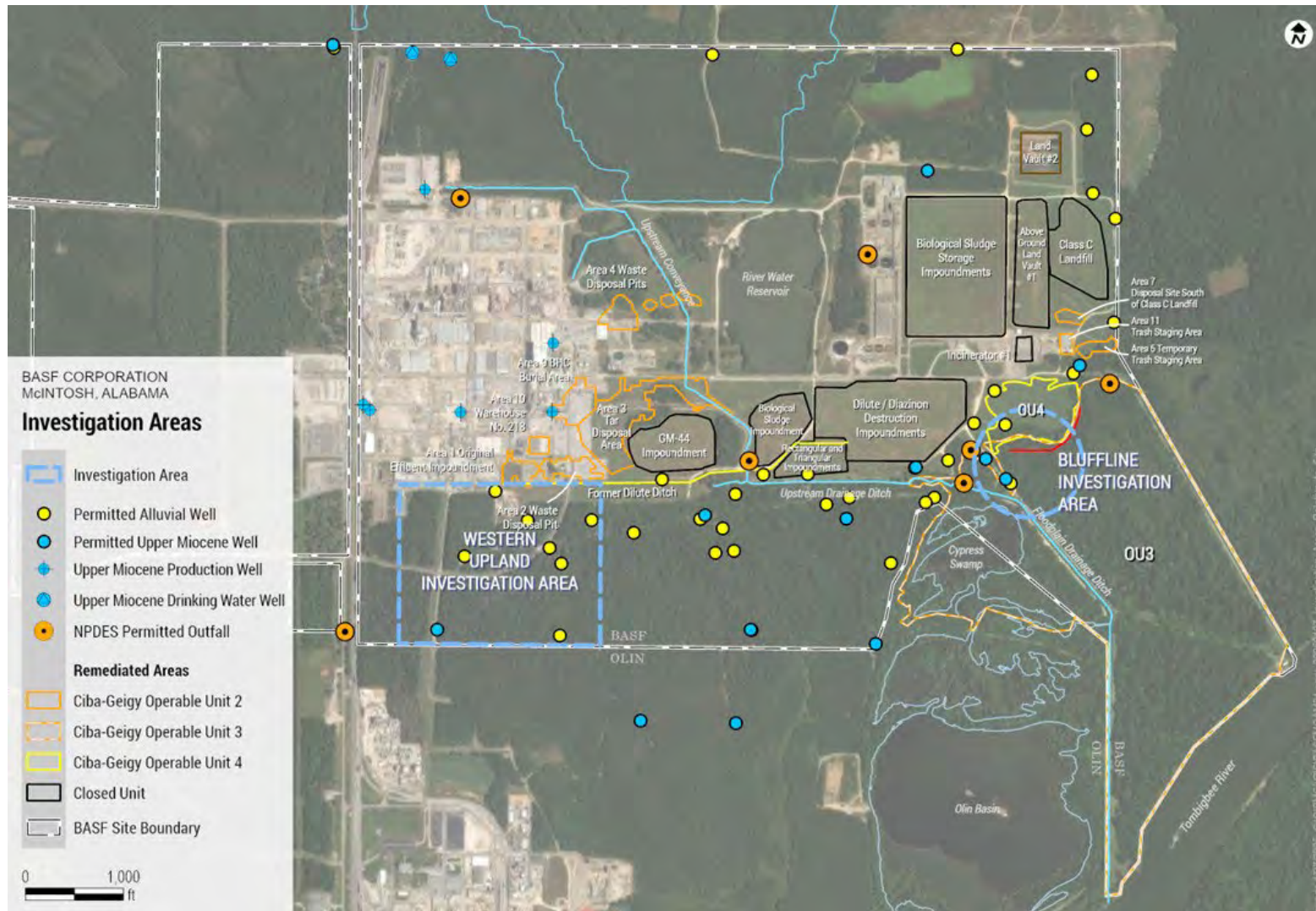


Figure 3. 2018 through 2024 Phased Investigation and supplemental Corrective Actions areas: western upland and bluffline.



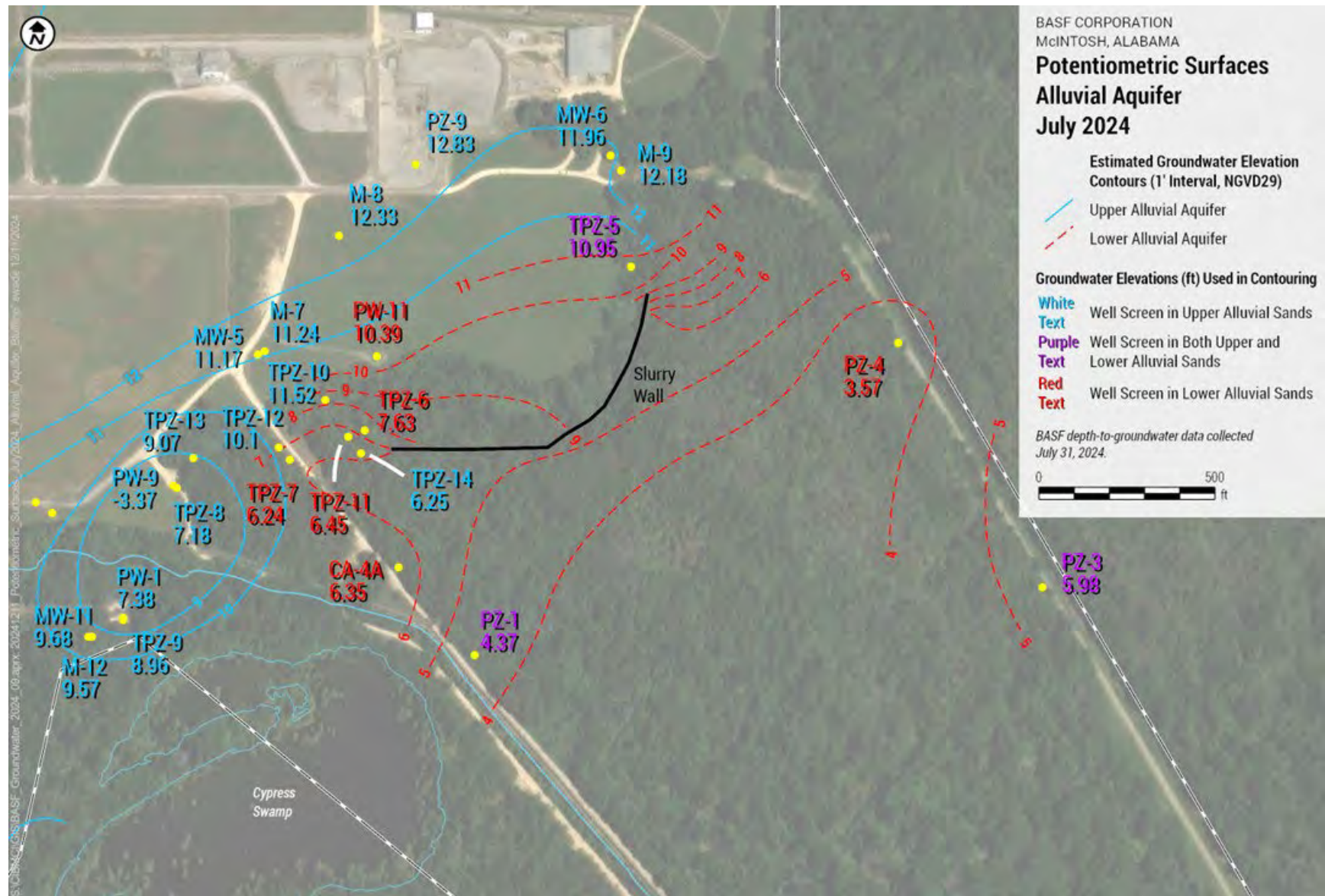


Figure 4. July 2024 groundwater elevation contours of Upper and Lower Alluvial Aquifer in bluffline area.

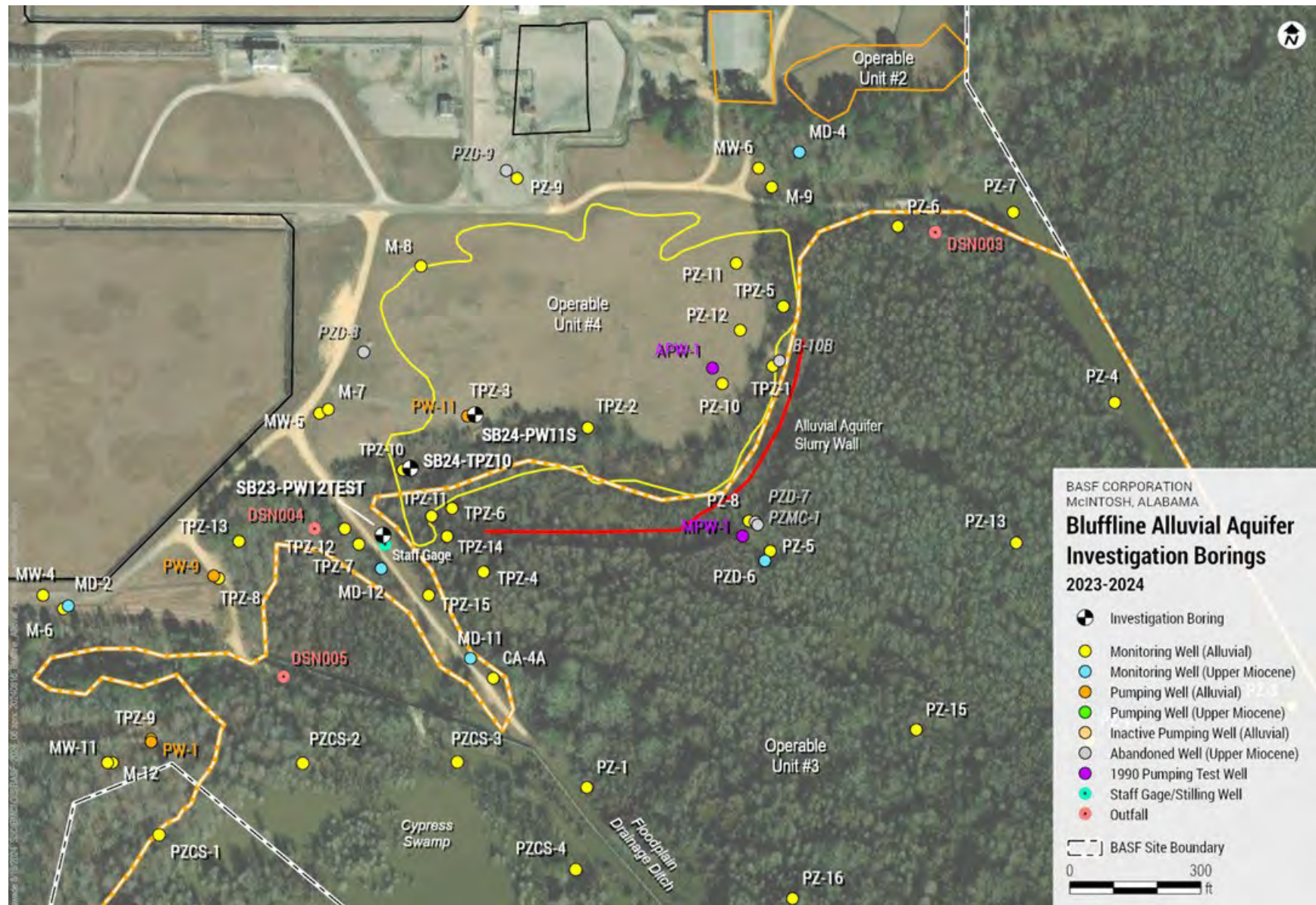


Figure 5. Location map of bluffline area 2023- 2024 Alluvial Aquifer investigation borings SB23-PW12TEST, SB24-PW11S and SB24-TPZ10.



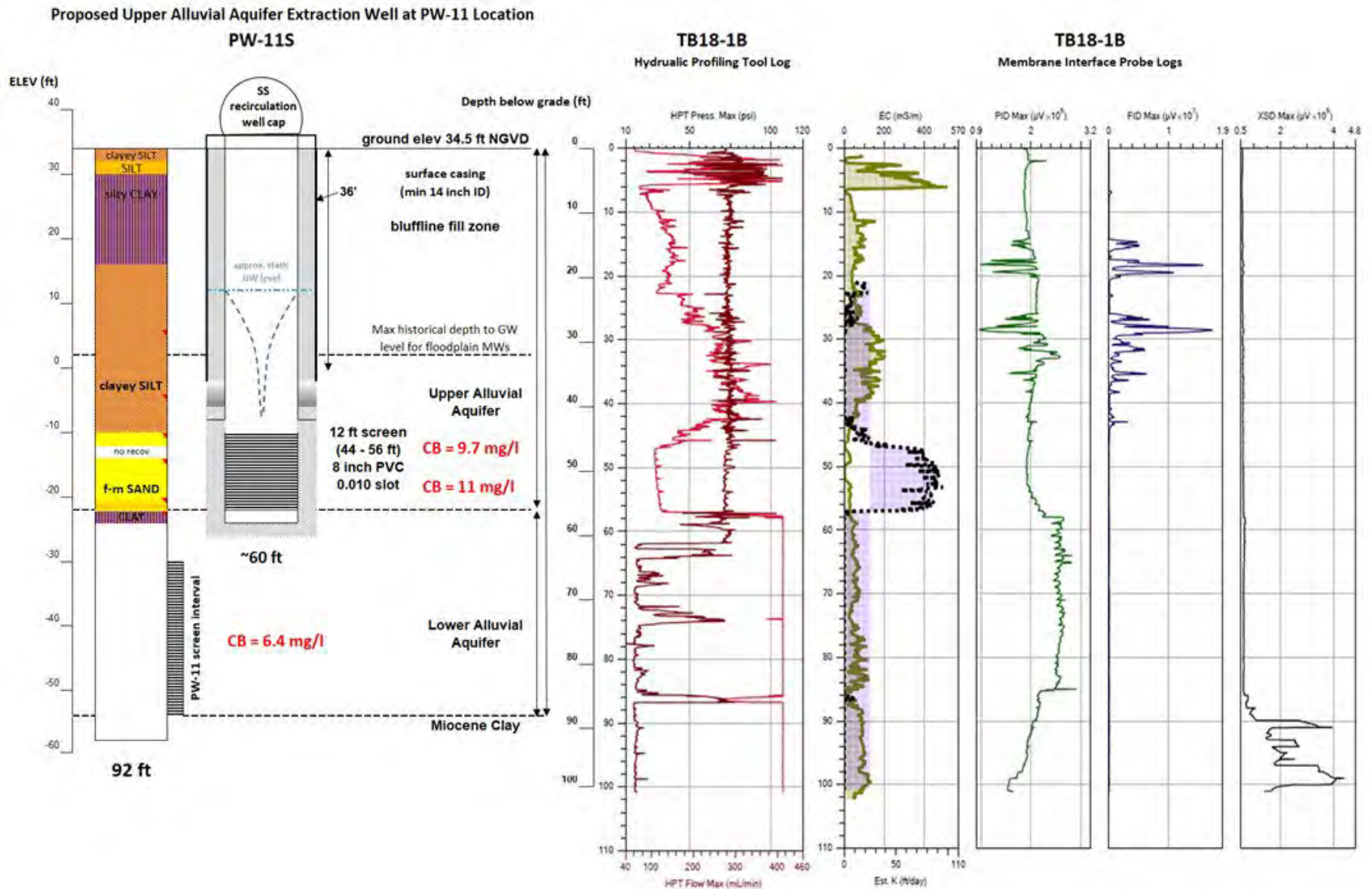


Figure 6. Proposed Upper Alluvial Aquifer extraction well PW-11S design and operation based on 2018 - 2024 investigation data.





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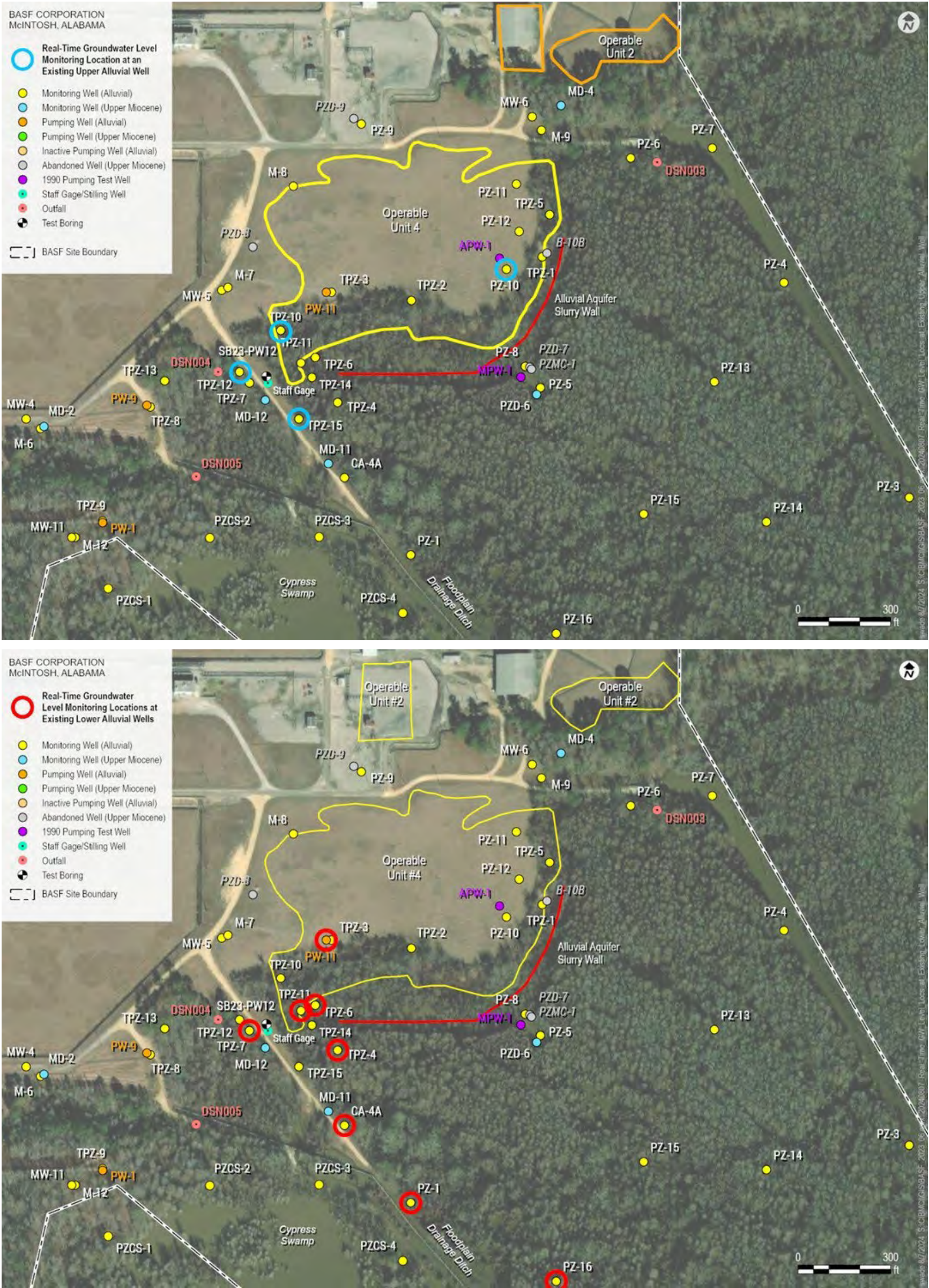


Figure 8. Bluffline-area continuous groundwater level monitoring stations in Upper and Lower Alluvial Aquifer wells.

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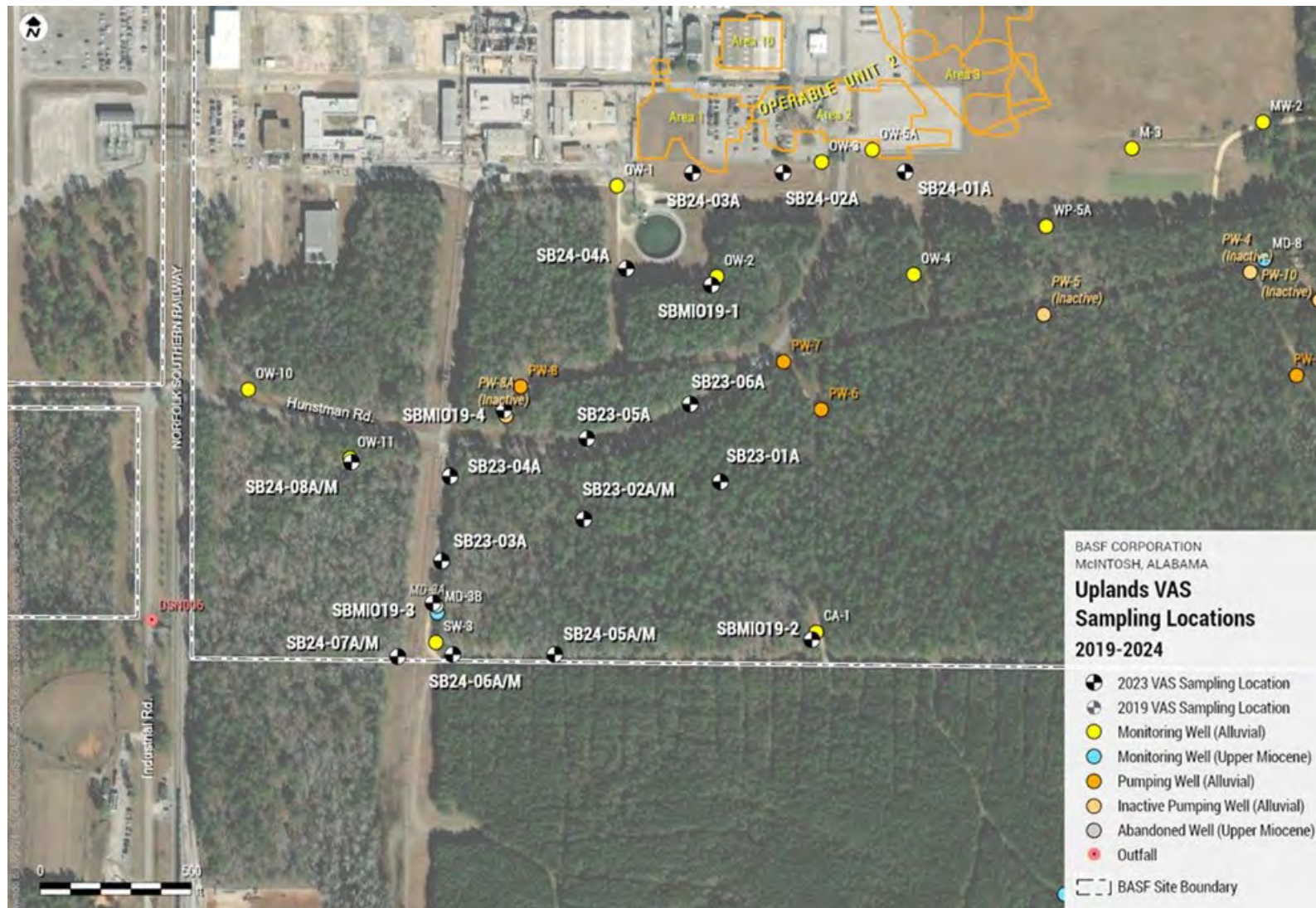


Figure 9. Uplands area Vertical Aquifer Sampling (VAS) investigation borings, 2019 - 2024.



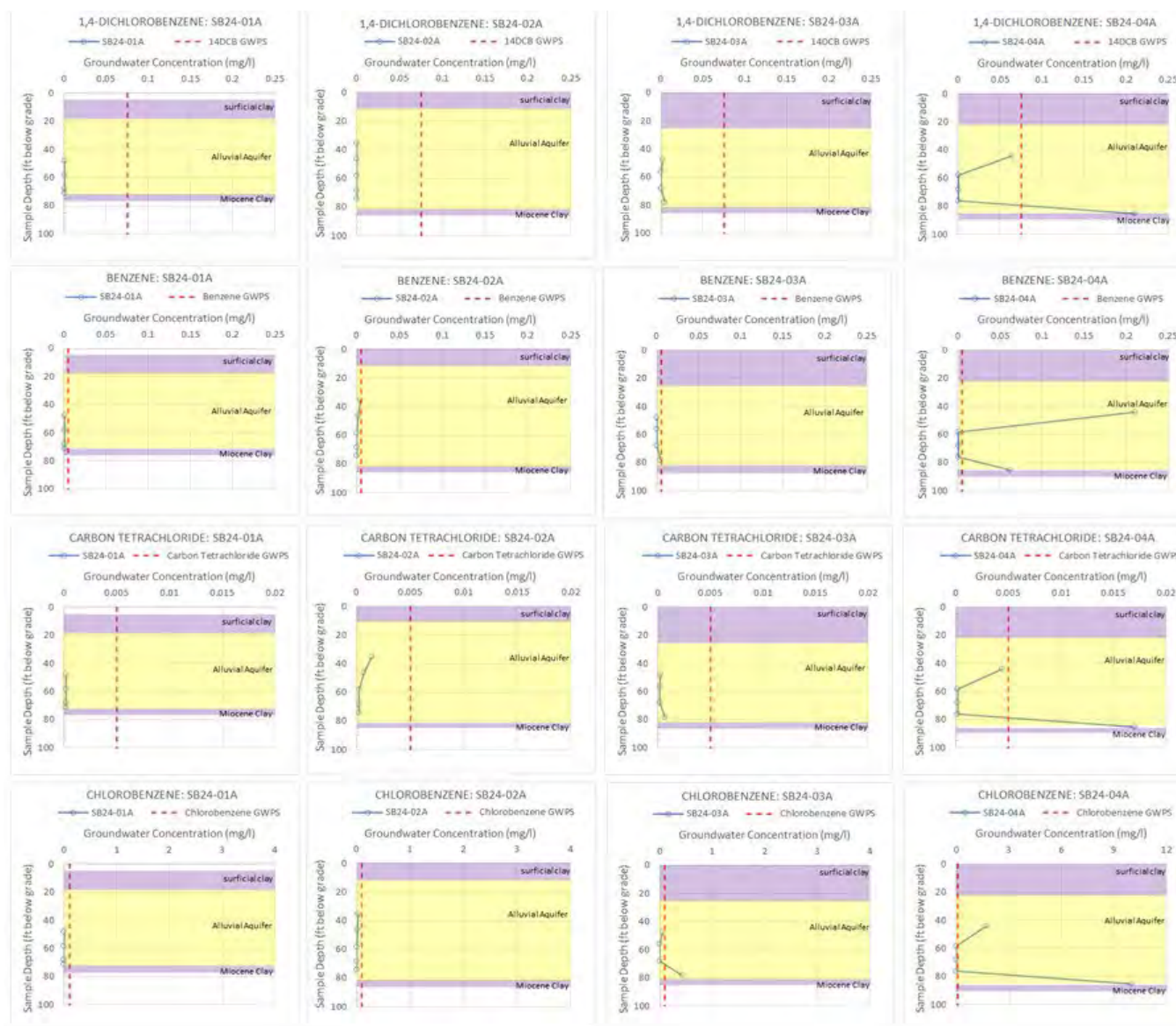


Figure 10. Depth profiles of VOCs detected in 2024 Alluvial Aquifer groundwater samples collected from test borings SB24-01A through SB24-04A



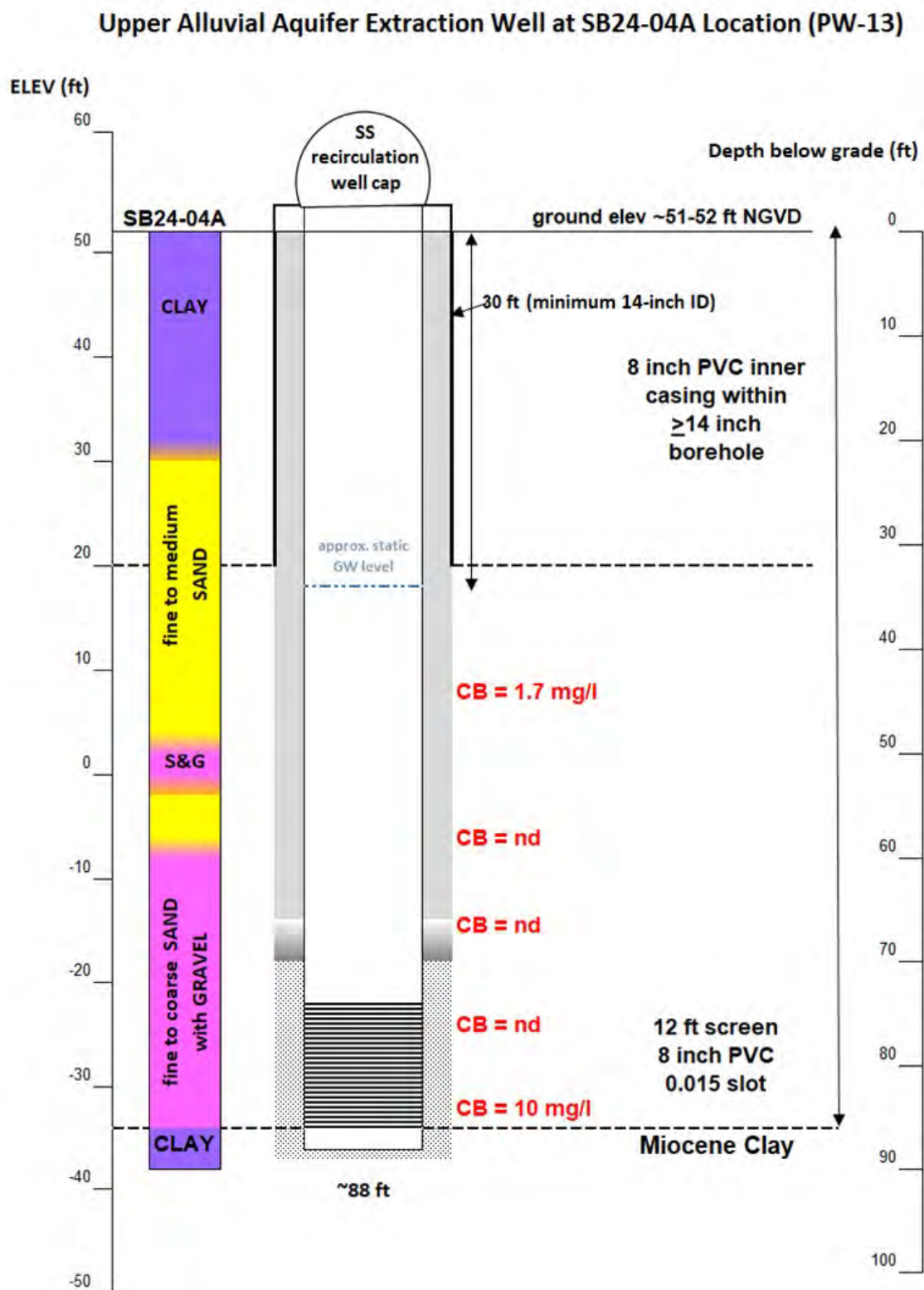


Figure 11. Proposed design for new Uplands Alluvial Aquifer extraction well PW-13 near SB24-04A location.



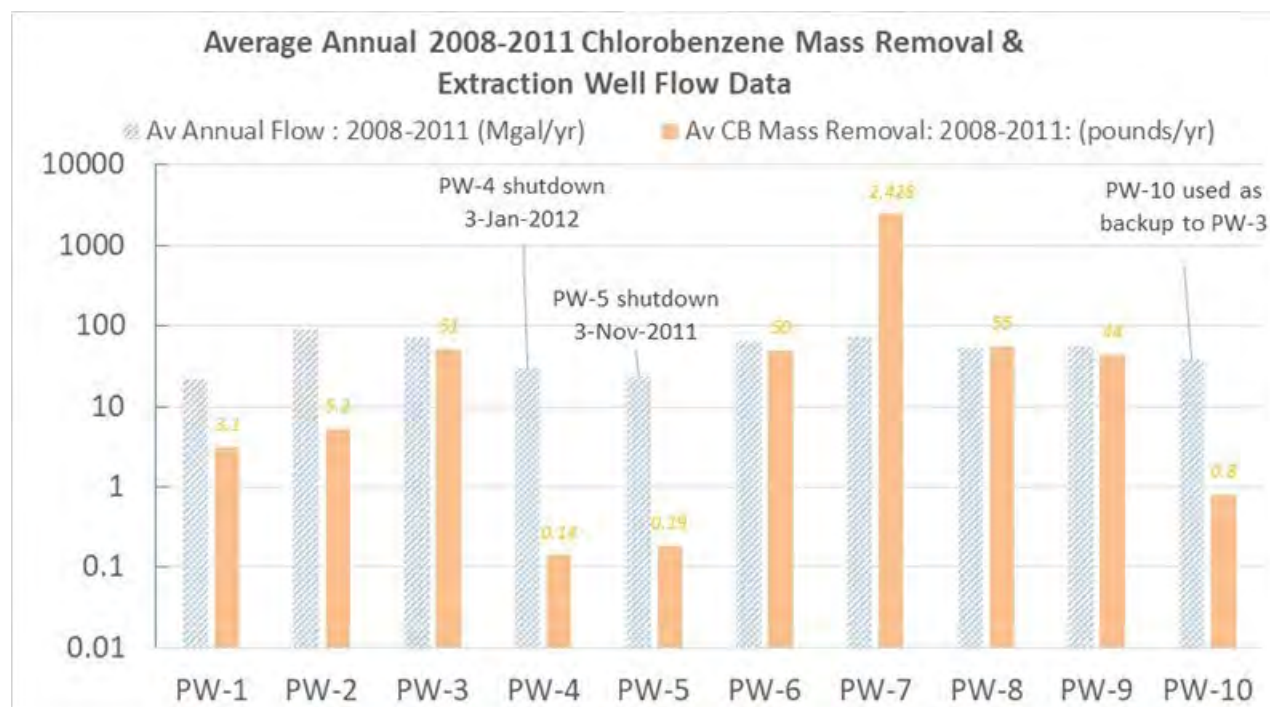


Figure 12. Alluvial Aquifer extraction system average annual flow rates and chlorobenzene mass removal rates by pumping well (2008 – 2011).

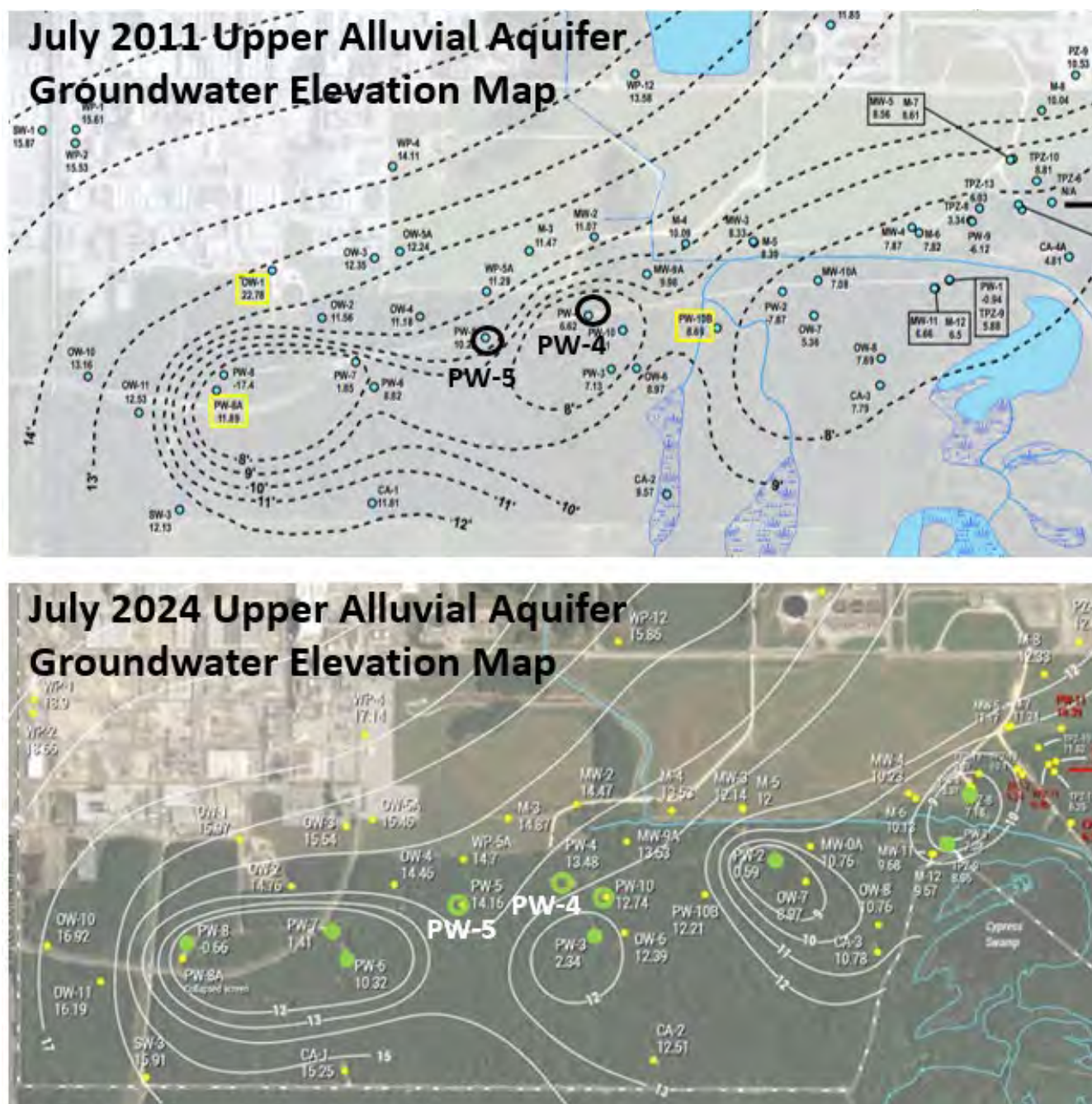


Figure 13. Alluvial Aquifer groundwater elevation maps: July 2011 (before the November 3, 2011 shutdown of PW-5) and July 2024.

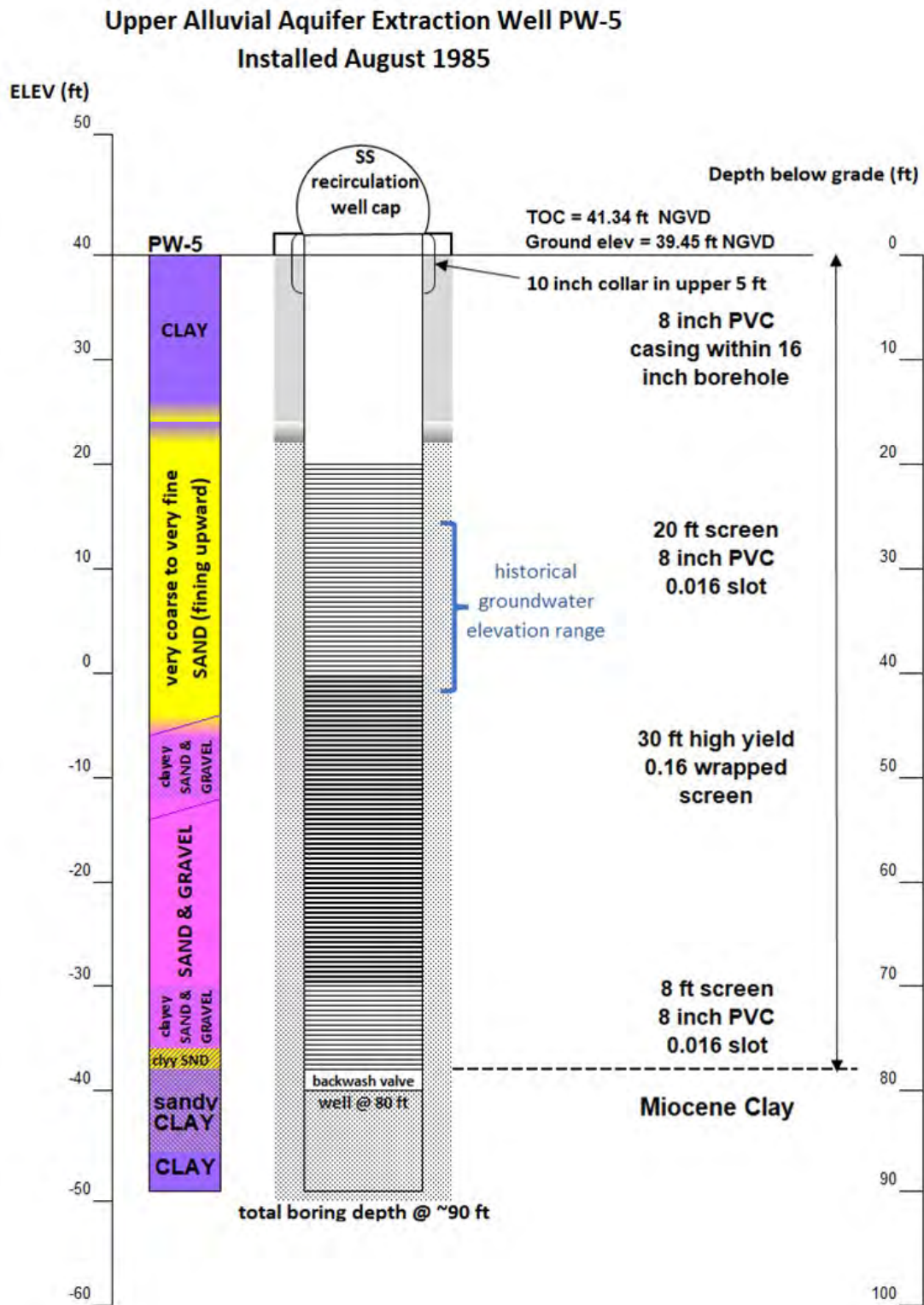


Figure 14. PW-5 well construction diagram.

Appendix A. Boring Logs



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LITHOLOGIC LOG

WELL NUMBER: PW-5
OWNER: Ciba-Geigy Corporation
LOCATION: McIntosh, Alabama
DATE DRILLED: August 14, 1985
PELA GEOLOGISTS: M. D. Wilder and A. F. Patton

Interval (feet BLS)	Description
0 - 2.5	Clay, moderate brown (5YR 4/4) to moderate yellowish-brown (10YR 5/4) sand and clay (fill material).
2.5 - 5.0	Clay, moderate yellowish-brown (10YR 5/4) to moderate brown (5YR 4/4) and moderate reddish-brown (10R 4/6) stained clay and minor silt and abundant organic material, twigs etc. up to 2 inches long.
5.0 - 10.0	Clay, dark yellowish-orange (10YR 6/6) to light brown (5YR 5/6) to moderate brown (5YR 4/4) and light gray with moderate reddish-brown (10R 4/6) stain, very minor very-fine-grained sand, subangular to subrounded, and organics (twigs) fall in.
10.0 - 15.0	Clay, light gray with moderate reddish-brown (10R 4/6) stain, very minor very-fine-grained sand, subangular to subrounded clear quartz.
15.0 - 17.0	Sandy clay, clay is as above, sand content is increasingly very-fine-grained, clear, quartz, subrounded to subangular, abundant black organics.
17.0 - 20.0	Slightly clayey sand, very-fine-grained clear quartz, subrounded to subangular, abundant black organics, clay is light gray with moderate reddish-brown (10R 4/6) stain.
20.0 - 25.0	Sand, clear quartz, very-fine-grained, subrounded to subangular, abundant black organics.
25.0 - 30.0	Sand, clear quartz, very-fine-grained, subrounded to subangular, abundant black organics.
30.0 - 35.0	Sand, clear quartz, very-fine- to fine-grained, subrounded to subangular, driller's remark: "tight sand at 31 feet."



LITHOLOGIC LOG
PW-5 (continued)

Interval
(feet BLS)

Description

35.0 - 40.0	Sand, clear quartz to opaque to very pale orange (10YR 8/2) and black and moderate reddish-brown (10R 4/6), fine- to medium-grained, subrounded to subangular.
40.0 - 45.0	Sand, clear and opaque quartz, medium- to very-coarse-grained with some 2 to 4 mm gravel, poorly sorted, subangular clay trace, light gray stained with moderate reddish-brown.
45.0 - 50.0	Clayey sand and gravel, quartz, subangular, opaque and multicolored, coarse- to very-coarse-grained to 6 mm in diameter, clay is light gray with moderate reddish-brown (10R 4/6) stains.
50.0 - 55.0	Clayey sand and gravel as above, with clay content increasing slightly and gravel content decreasing slightly.
55.0 - 60.0	Sand and gravel, quartz, opaque and multicolored, coarse- to very-coarse-grained to 6 mm in diameter, gravel content increasing.
60.0 - 65.0	Sand and gravel, quartz, clear opaque to milky to black, medium- to very-coarse-grained to 4 mm in diameter, poorly sorted, black organics fairly abundant.
65.0 - 70.0	Slightly clayey sand and gravel, quartz, clear to opaque, poorly sorted, medium- to very-coarse-grained with trace of gravel, subangular to subrounded, clay content is increasing, light gray with moderate reddish-brown (10R 4/6) stain.
70.0 - 75.0	Clayey sand and gravel, quartz, clear to milky to black, medium-grained to 10 mm in diameter, subangular, clay is light gray, clay content is increasing.
75.0 - 77.0	Very clayey sand, quartz, clear, medium- to very-coarse-grained, subangular, gravel trace, clay is light gray with minor moderate reddish-brown (10R 4/6) stain.
77.0 - 80.0	Sandy clay, light gray with moderate reddish-brown (10R 4/6) stain, sand is quartz, medium- to very-coarse-grained, clear, subangular, trace gravel.



LITHOLOGIC LOG
PW-5 (continued)

Interval
(feet BLS)

Description

80.0 - 85.0	Slightly sandy clay, light gray with moderate reddish-brown (10R 4/6) stain, sand is fine- to very-coarse-grained, clear, quartz, subangular to subrounded, gravel trace, up to 6 mm in diameter.
85.0 - 90.0	Clay, light gray with moderate reddish-brown (10R 4/6) stain with trace of sand as above.
90.0	Total depth.

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Moist		
50							
			0				Silty Clay SILTY CLAY with organics and grass, shell fragments, brown; (1.4')
							Silty Sand SILTY SAND, fill material, red; (0.6')
							Silty Clay SILTY CLAY, gray; (1.8')
							Silty Sand SILTY SAND, shell fragments, tan; (0.5')
							Silty Clay SILTY CLAY, gray with orange mottling; (3.2')
5.0							
45							
							No Recovery; (1.5')
					Moist		
							Silty Clay SILTY CLAY, reddish brown; (1.7')
10.0			0				
40							Silty Clay SILTY CLAY, gray with orange mottling; (4.8')
15.0							No Recovery; (3.5')
35							
					Moist		
							Silty Clay SILTY CLAY, reddish brown; (3.7')
20.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
30			0				
25.0	8.5'/10'						Silty Sand
25							SAND, fine grained, tan to orange; (3.5')
							No Recovery; (1.5')
30.0			0		Moist		SAND, fine grained, tan; (3.5')
20							
	4.5'/10'				Wet		SAND, fine to medium grained, tan to orange; (1.0')
35.0							No Recovery; (5.5')
15							
40.0			1.0		Wet		SAND, fine to medium, tan; (3.5')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
10							
		6'/10'	6.6	SOIL (42-44') & GW (42-44')			Sand
45.0							No Recovery; (4.0')
5							
50.0					Wet		Sand
0							SAND with GRAVEL, fine to coarse grained, tan to orange; (3.7')
		9'/10'					Clayey Sand
							CLAYEY SAND, gray to orange; (0.8')
							Sand
							SAND, fine to medium grained, orange; (1.5')
55.0							Sand
-5				SOIL (56-58') & GW (56-58')			SAND, fine to medium grained, with little gravel and coarse grained sand, tan; (3.0')
							No Recovery; (1.0')
60.0					Wet		Sand
							SAND with GRAVEL, fine to coarse grained, tan to orange; (6.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-10			0.3				
		9'/10'					
65.0			0.5				
-15				SOIL (66-68') & GW (66-68')			
							No Recovery; (1.0')
70.0			0.7		Wet		
-20		8'/10'					
75.0				SOIL (74-76') & GW (74-76')			
-25							No Recovery; (2.0')
80.0			0.4		Wet		

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION

-30							
		8.2'/10'	55.3	SOIL (83-85') & GW (83-85')			Sand SAND with GRAVEL, fine to coarse, tan to orange; (4.9')
85.0							
-35							Clay CLAY, Miocene; (0.8')
							No Recovery ; (1.8')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/22/24

TOTAL DEPTH: 58'
DEPTH TO WATER: ~44'
GROUND SURFACE ELEVATION: 33.97'
LATITUDE: 31.276866°
LONGITUDE: -87.986717°
DATE COMPLETED: 2/20/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Moist		Clayey Silt CLAYEY SILT, brown; (2.0')
30		5'/5'	0				Silt SILT, hard, tan-white; (3.0')
5.0		2.6'/3'	0				Silty Clay SILTY CLAY, soft, orange-gray brown; (2.6')
							No Recovery; (2.4')
25					Moist		Silty Clay SILTY CLAY, soft, wood fragments, brown-gray; (2.3')
10.0							Silty Clay SILTY CLAY, soft, red-brown; (4.3')
20		10'/10'	0				Silty Clay SILTY CLAY, soft, shell fragments, red-brown to gray; (3.4')
15.0							
15					Moist		Clay CLAY with SILT, red-orange; (6.8')
20.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/22/24

TOTAL DEPTH: 58'
DEPTH TO WATER: ~44'
GROUND SURFACE ELEVATION: 33.97'
LATITUDE: 31.276866°
LONGITUDE: -87.986717°
DATE COMPLETED: 2/20/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
10		10'/10'	0				
25.0							
30.0					Moist		Clayey Silt CLAYEY SILT, dark gray, chemical odor; (3.2')
35.0		10'/10'	0				
							Clayey Silt CLAYEY SILT, soft, shell fragments, red-brown; (7.0')
							Clayey Silt CLAYEY SILT, wood fragments, brown; (3.0')
40.0					Moist		Clayey Silt CLAYEY SILT, red-brown to gray; (6.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/22/24

TOTAL DEPTH: 58'
DEPTH TO WATER: ~44'
GROUND SURFACE ELEVATION: 33.97'
LATITUDE: 31.276866°
LONGITUDE: -87.986717°
DATE COMPLETED: 2/20/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
45.0			8'/10'	10.1			
				GW (44-46') & SOIL (44-46')	Wet		SAND, fine to medium grained, gray, chlorobenzene odor; (2.0')
							No Recovery; (2.0')
50.0					Wet		SAND, fine to medium grained, gray, chlorobenzene odor; (4.0')
			10'/10'	19.7			
				20.4			SAND, fine to coarse grained, gray, chlorobenzene odor; (3.0')
55.0				GW (53-55') & SOIL (53-55')			Silty Sand
							SILTY SAND with some CLAY, tan-orange; (1.0')
							Silty Clay
							SILTY CLAY, gray, stiff; (2.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/21/24

TOTAL DEPTH: 68'
DEPTH TO WATER: ~37'
GROUND SURFACE ELEVATION: 25.09'
LATITUDE: 31.276866°
LONGITUDE: -87.987188°
DATE COMPLETED: 2/21/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0	25				Dry		Silty Clay
		5' / 8'	0				SILTY CLAY, stiff, brown to reddish orange; (5.0')
5.0	20						No Recovery; (3.0')
					Moist		Silty Clay
							SILTY CLAY, stiff, shell fragments, brown to reddish orange; (2.0')
10.0	15						Silty Clay
		8' / 10'	0				SILTY CLAY, soft, shell fragments, dark gray to black; (6.0')
15.0	10						No Recovery; (2.0')
					Moist		Silty Clay
							SILTY CLAY, reddish orange; (1.0')
20.0							Organics
							ORGANICS, tree debris, black; (7.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/21/24

TOTAL DEPTH: 68'
DEPTH TO WATER: ~37'
GROUND SURFACE ELEVATION: 25.09'
LATITUDE: 31.276866°
LONGITUDE: -87.987188°
DATE COMPLETED: 2/21/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
5							
25.0	0	8'/10'	0				
							No Recovery; (2.0')
30.0	-5				Moist-Wet		Silty Clay SILTY CLAY, shell fragments and tree debris, reddish orange; (6.5')
35.0	-10	7.5'/10'	0				Sandy Clay SANDY CLAY, fine grained, gray; (1.0')
							No Recovery; (2.5')
				GW (37-39') & SOIL (39')			
					Wet		Sand SANDY, fine to coarse grained; (1.0')
40.0							Silty Clay SILTY CLAY, stiff, gray; (9.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/21/24

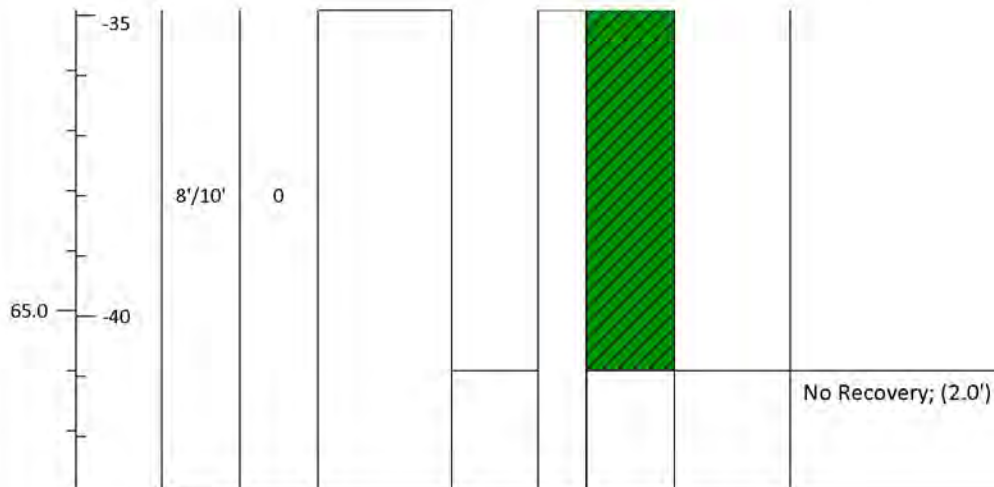
TOTAL DEPTH: 68'
DEPTH TO WATER: ~37'
GROUND SURFACE ELEVATION: 25.09'
LATITUDE: 31.276866°
LONGITUDE: -87.987188°
DATE COMPLETED: 2/21/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
15.0							
20.0		10'/10'	10.1				
25.0							
30.0							
35.0							
40.0							
45.0							
50.0		8'/10'	0		Moist		Clay CLAY with some SILT, bluish gray; (8.0')
55.0							
60.0							
65.0							
68.0							
							No Recovery; (2.0')
					Moist		Clay CLAY with some SILT, bluish gray; (8.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/21/24

TOTAL DEPTH: 68'
DEPTH TO WATER: ~37'
GROUND SURFACE ELEVATION: 25.09'
LATITUDE: 31.276866°
LONGITUDE: -87.987188°
DATE COMPLETED: 2/21/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION



Project: CIBA Site OU No. 4 Slurry wall wells

Well/Boring No.: TPZ-6

Project No.: 6174

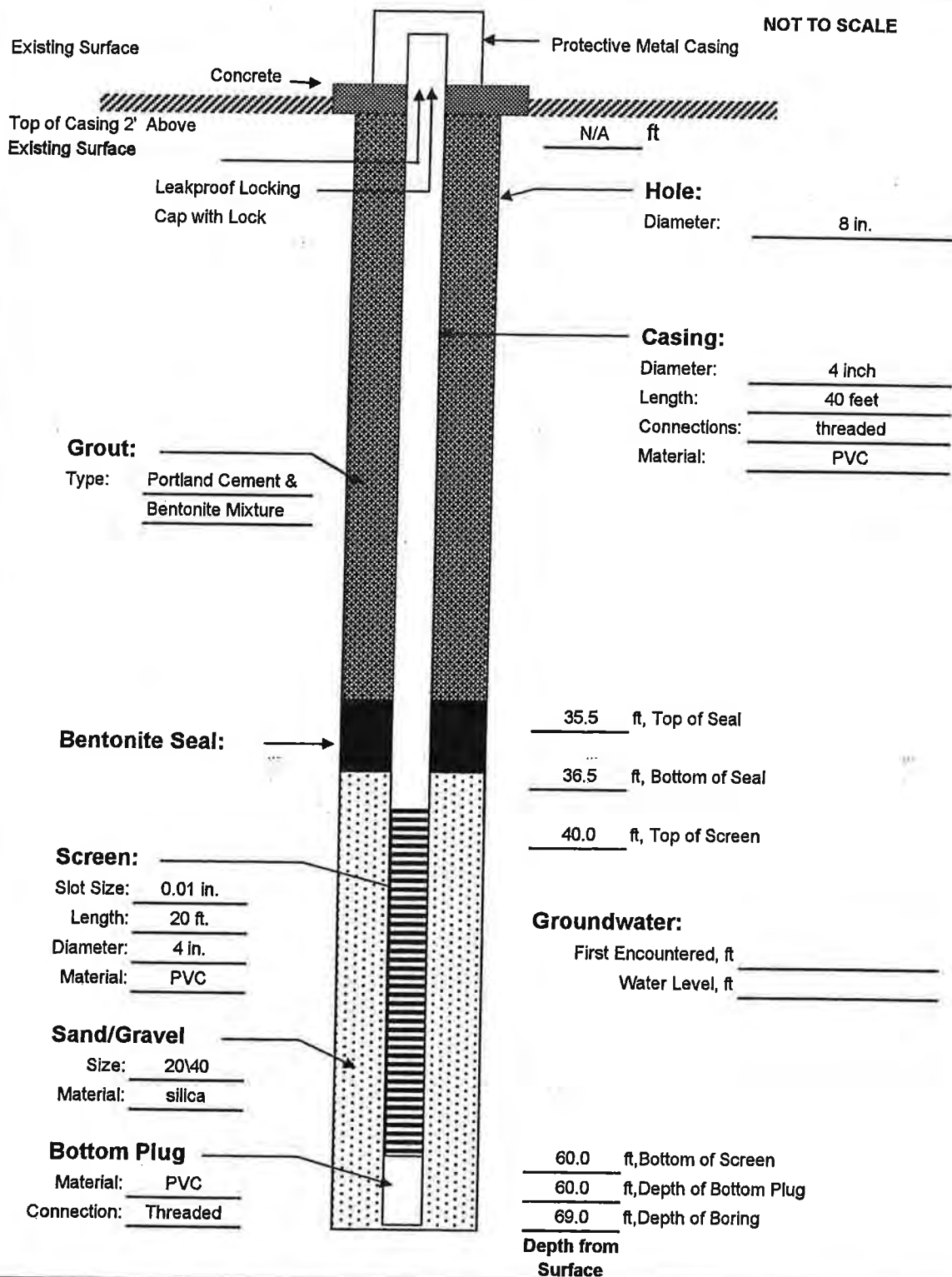
Drilling Supervisor: Robert H. Spencer

Boring Location: West end of slurry wall

Date(s): 08/26-27/1997

Drilling Method: Mud Rotary

Drilling Contractor: Geotechnical Engineering

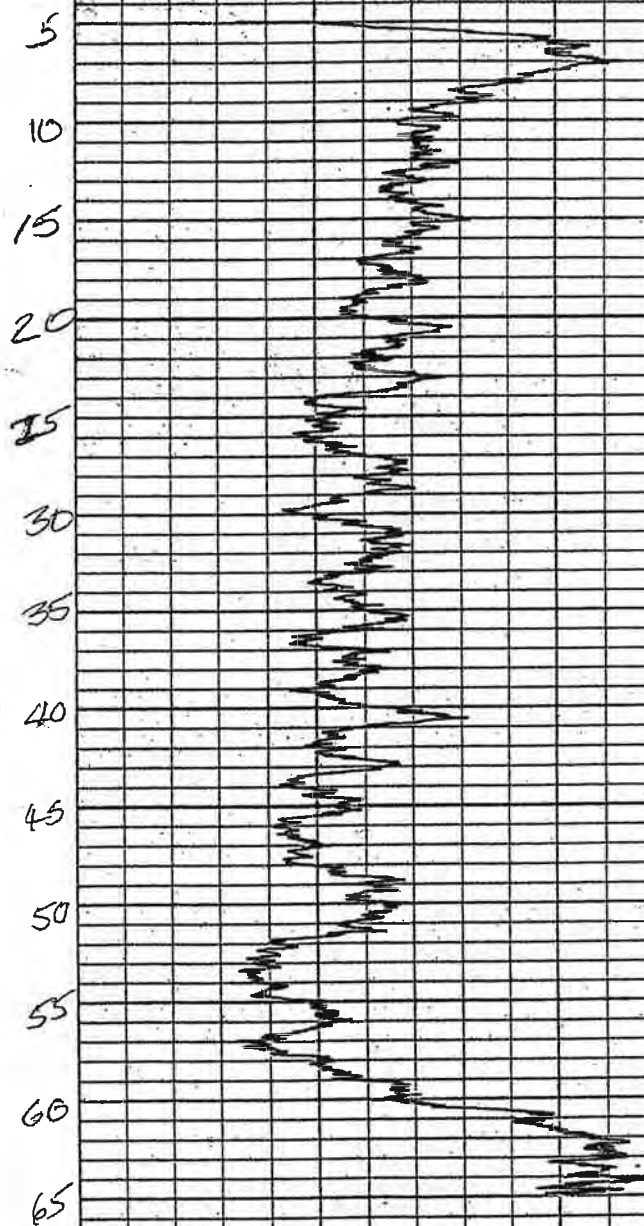


Comments:

8-25-97

TP 26

NATURAL CANADA



Project: CIBA Site OU No. 4 Slurry wall wells

Sheet 1 of 2

Project No.: 6174 Logged by: Robert Spencer

Well/Boring: TPZ-6

Well/Boring Location: West end of slurry wall

Date: August 26-27, 1997

Drilling Method: Mud rotary

Depth to Groundwater: _____

Elevations - Ground Surface: _____

Driller: Geotechnical Engineering

Remarks: _____

Sands-SW, SP

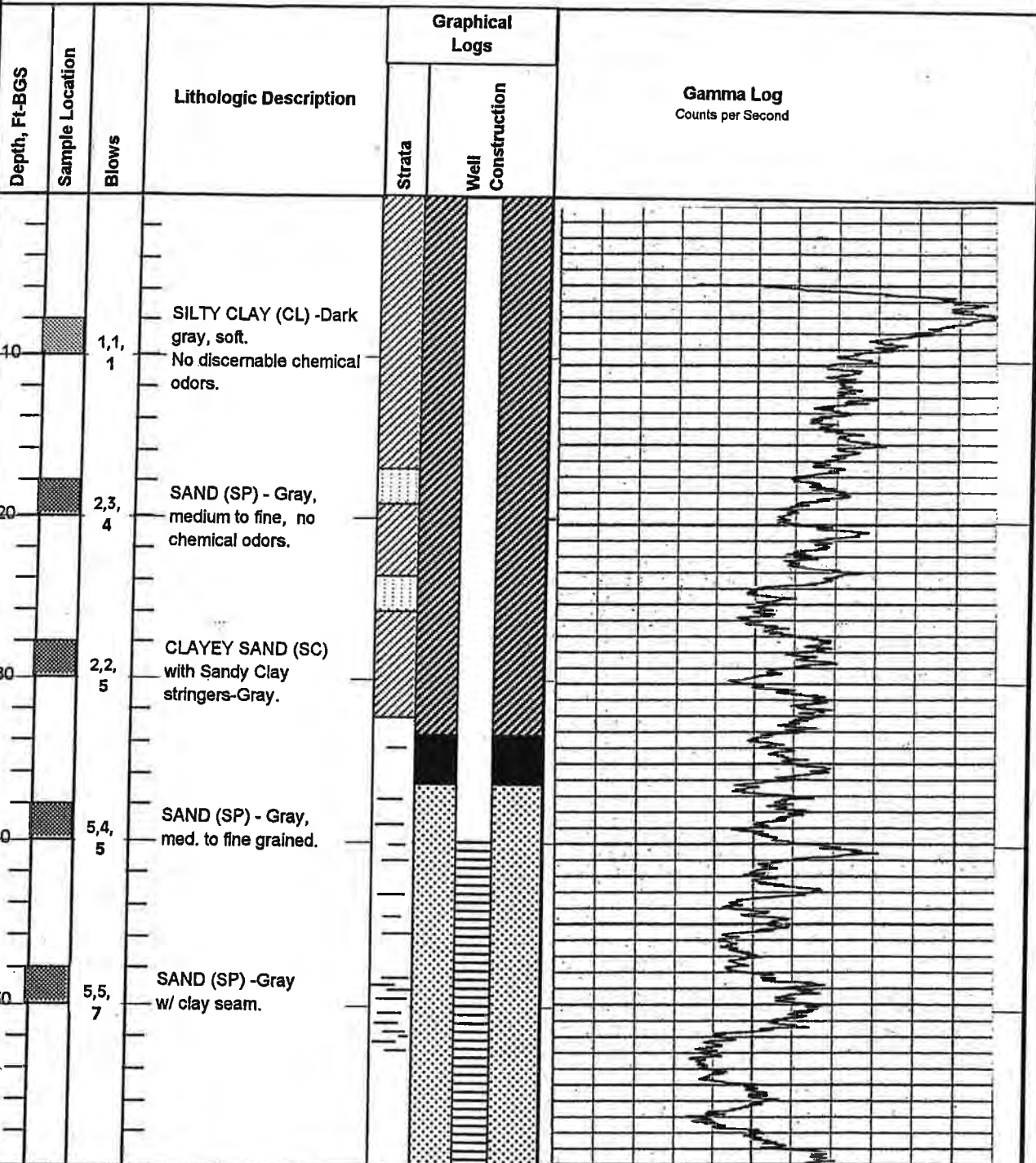
Silt-ML, MH

Clays-CL, CH

Organic soils-PT

Gravels, GW, GP

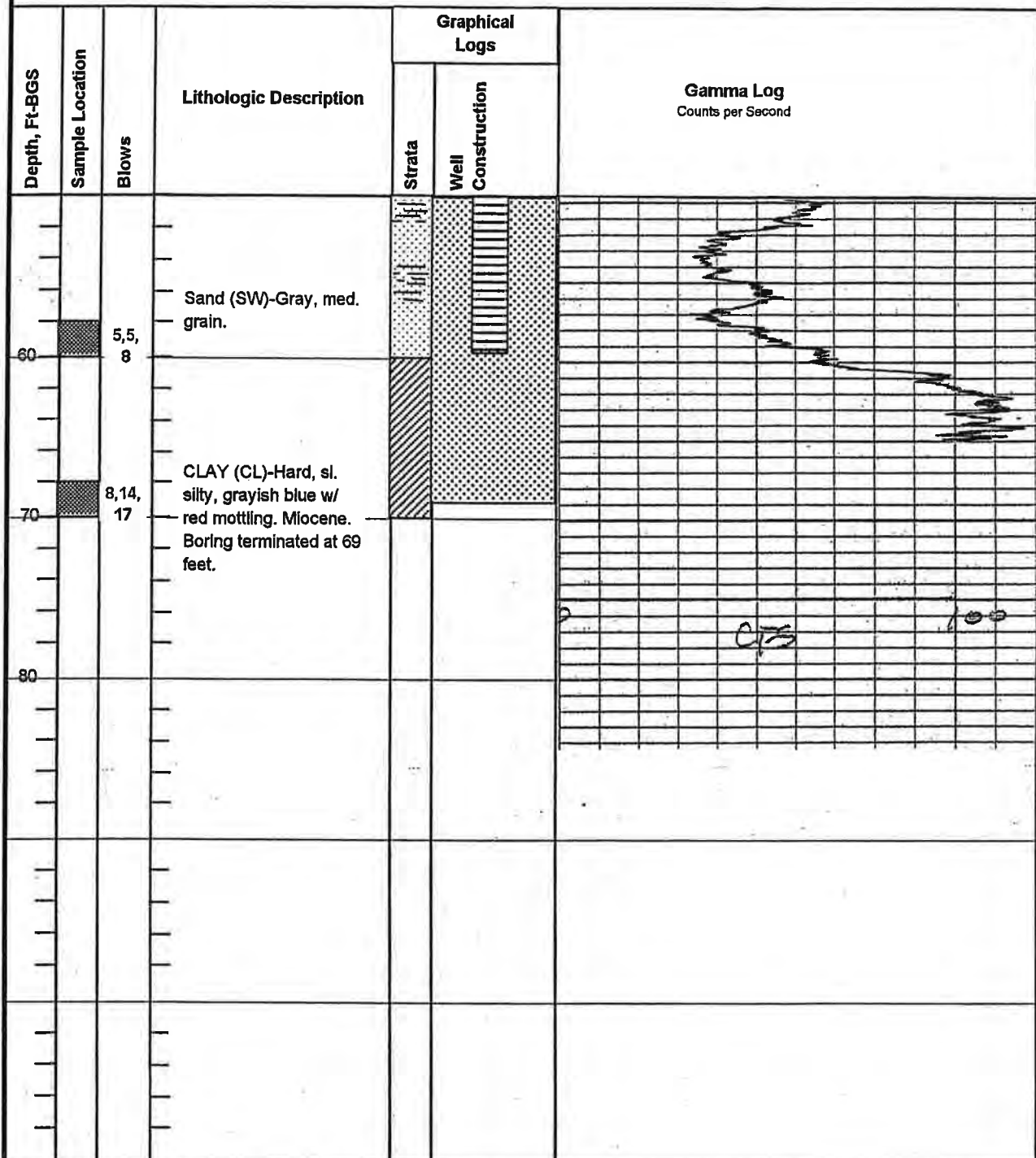
Sands w/ fines-SM, SC



Project: CIBA Site OU No. 4 Slurry wall wells
Project No.: 6174

Well/Boring: TPZ-6
Logged By: Robert Spencer

Sheet 2 of 2



Note: Not all portions of this form are applicable to all projects

5/91

Appendix B. Grain Size Data



2023 and 2024 Alluvial Aquifer Grain Size Data
Particle Size of Soils by ASTM D422

	SATURATED ALLUVIAL SANDS										
BORING LOCATION:	SB23-PW12TEST			SB24-PW11S		SB24-TPZ10	SB24-04A				
SAMPLE DATE:	25-May-23			20-Feb-24		21-Feb-24	12-Mar-24			13-Mar-24	
SAMPLE INTERVAL:	40 - 44 ft	44 - 46 ft	50 - 52 ft	44-46 ft	53-55 ft	37-39 ft	42 - 44	56 - 58	66 - 68	74 - 76	83 - 85
% GRAIN SIZE (ASTM D422)											
GRAVEL	0.0	0.0	0.0	0.0	2.6	13.9	36.2	2.6	1.3	54.9	27.1
SAND	85.2	85.8	84.8	95.3	89.3	80.3	59.6	94.9	97.1	43.4	69.7
coarse	0.0	0.5	0.0	0.0	2.1	11.7	6.3	2.5	2.1	10.5	10.4
medium	0.0	9.7	6.6	4.6	48.6	50.2	26.4	64.1	47.8	19.2	36.9
fine	85.2	75.6	78.2	90.7	38.6	18.4	26.9	28.3	47.2	13.7	22.4
SILT	9.5	5.4	11.1	2.3	3.8	2.1	0.3	0	0.4	0.8	1.5
CLAY	5.3	8.8	4.1	2.4	4.2	3.7	4	2.5	1.2	0.9	1.7
% SOLIDS	75.3	78.4	79.6	82.0	81.3	88.4	83.8	79.4	82.8	89.1	87.3
SPECIFIC GRAVITY	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650	2.650



Particle Size of Soils by ASTM D422

Sample ID: SB23-PW12TEST-40-44
 Lab ID: 400-238353-A-1

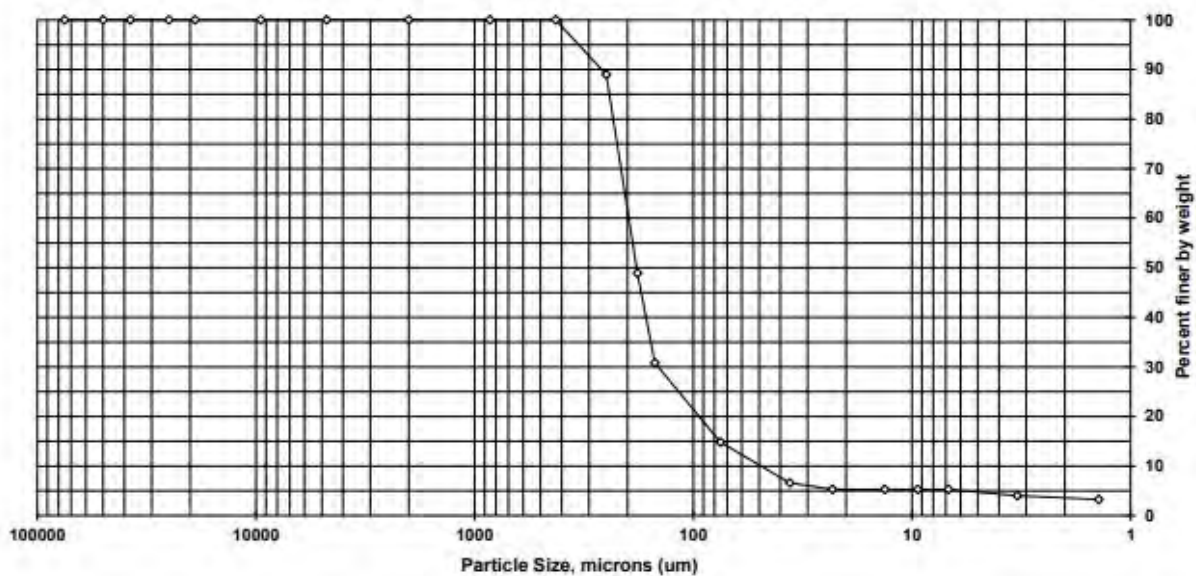
Percent Solids: 75.3%
 Specific Gravity: 2.650

Date Received: 5/26/2023
 Start Date: 6/9/2023
 End Date: 6/28/2023

Shape (> #10): na

Non-soil material: na

Hardness (> #10): na



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	100.0	0.0
#40	425	100.0	0.0
#60	250	89.0	11.0
#80	180	48.9	40.1
#100	150	30.8	18.1
#200	75	14.8	16.0
Hyd1	36.2	6.6	8.2
Hyd2	23.1	5.3	1.3
Hyd3	13.3	5.3	0.0
Hyd4	9.4	5.3	0.0
Hyd5	6.8	5.3	0.0
Hyd6	3.3	4.0	1.3
Hyd7	1.4	3.3	0.8

Soil Classification	Percent of sample
Gravel	0.0
Sand	85.2
Coarse Sand	0.0
Medium Sand	0.0
Fine Sand	85.2
Silt	9.5
Clay	5.3



Particle Size of Soils by ASTM D422

Sample ID: SB23-PW12TEST-44-46
 Lab ID: 400-238353-A-2

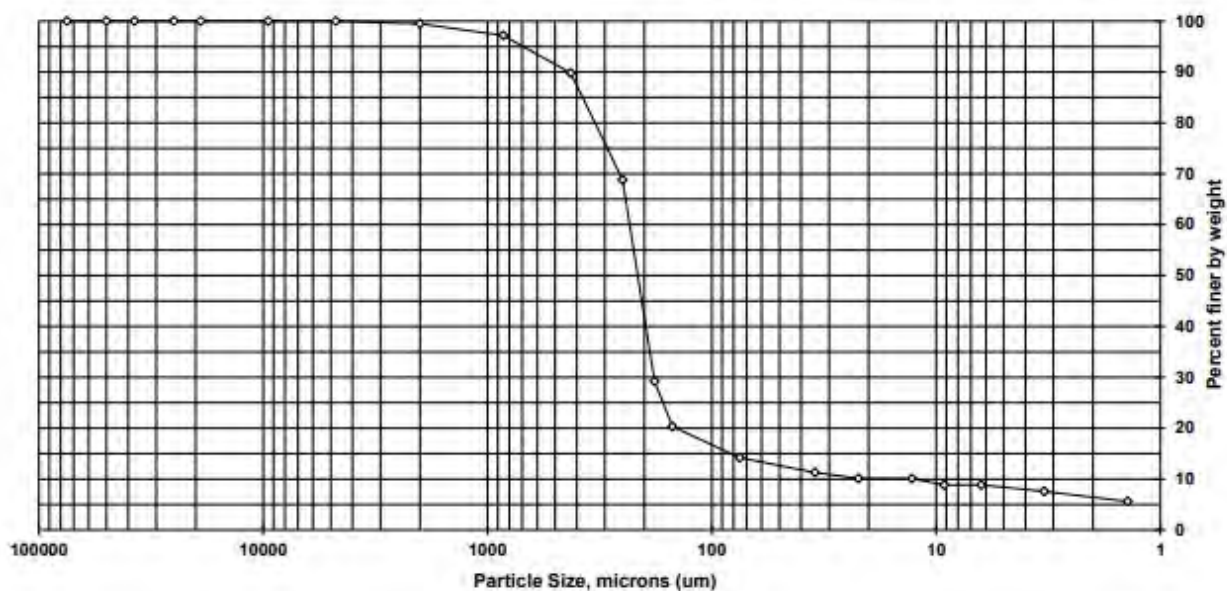
Percent Solids: 78.4%
 Specific Gravity: 2.650

Date Received: 5/26/2023
 Start Date: 6/9/2023
 End Date: 6/28/2023

Shape (> #10): rounded

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.5	0.5
#20	850	97.2	2.3
#40	425	89.8	7.4
#60	250	68.8	21.0
#80	180	29.2	39.6
#100	150	20.3	8.9
#200	75	14.2	6.1
Hyd1	34.7	11.3	2.9
Hyd2	22.2	10.1	1.2
Hyd3	12.8	10.1	0.0
Hyd4	9.2	8.8	1.3
Hyd5	6.3	8.8	0.0
Hyd6	3.3	7.6	1.3
Hyd7	1.4	5.6	2.0

Soil Classification	Percent of sample
Gravel	0.0
Sand	85.8
Coarse Sand	0.5
Medium Sand	9.7
Fine Sand	75.6
Silt	5.4
Clay	8.8



Particle Size of Soils by ASTM D422

Sample ID: SB23-PW12TEST-50-52
 Lab ID: 400-238353-A-3

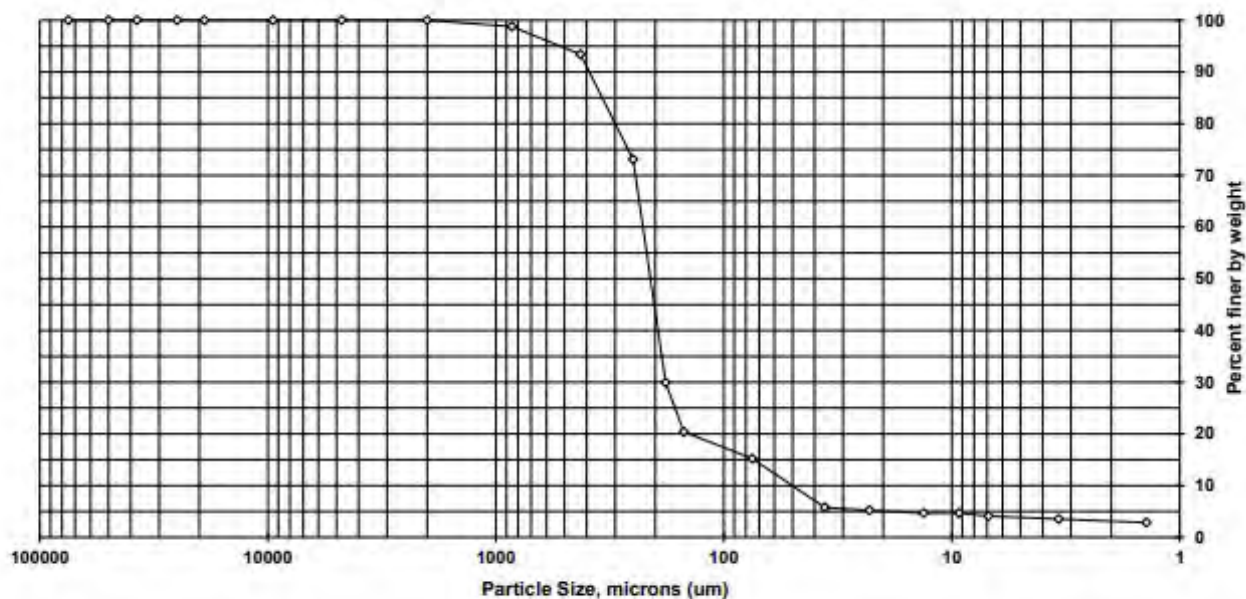
Percent Solids: 79.6%
 Specific Gravity: 2.650

Date Received: 5/26/2023
 Start Date: 6/9/2023
 End Date: 6/28/2023

Shape (> #10): na

Non-soil material: na

Hardness (> #10): na



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	98.8	1.2
#40	425	93.4	5.4
#60	250	73.1	20.3
#80	180	29.9	43.2
#100	150	20.4	9.5
#200	75	15.2	5.2
Hyd1	36.1	5.8	9.4
Hyd2	23	5.2	0.6
Hyd3	13.3	4.7	0.6
Hyd4	9.3	4.7	0.0
Hyd5	6.9	4.1	0.6
Hyd6	3.4	3.5	0.6
Hyd7	1.4	2.9	0.7

Soil Classification	Percent of sample
Gravel	0.0
Sand	84.8
Coarse Sand	0.0
Medium Sand	6.6
Fine Sand	78.2
Silt	11.1
Clay	4.1



Particle Size of Soils by ASTM D422

Sample ID: SB24PW11S-44-46
 Lab ID: 400-251671-A-1

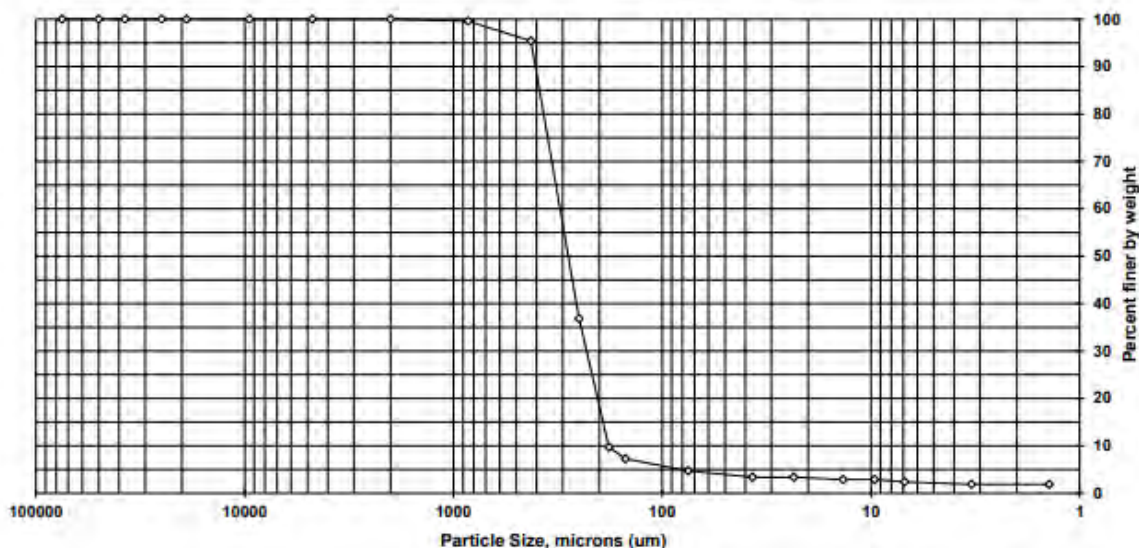
Percent Solids: 82.0%
 Specific Gravity: 2.650

Date Received: 2/23/2024
 Start Date: 2/29/2024
 End Date: 3/11/2024

Shape (> #10): na

Non-soil material: na

Hardness (> #10): na

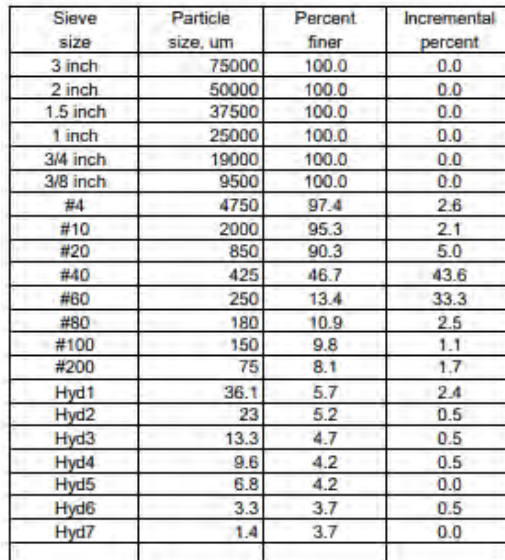


Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	99.6	0.4
#40	425	95.4	4.2
#60	250	36.8	58.6
#80	180	9.7	27.1
#100	150	7.2	2.5
#200	75	4.7	2.5
Hyd1	37	3.4	1.3
Hyd2	23.4	3.4	0.0
Hyd3	13.6	2.9	0.5
Hyd4	9.6	2.9	0.0
Hyd5	6.9	2.4	0.5
Hyd6	3.3	1.9	0.5
Hyd7	1.4	1.9	0.0

Soil Classification	Percent of sample
Gravel	0.0
Sand	95.3
Coarse Sand	0.0
Medium Sand	4.6
Fine Sand	90.7
Silt	2.3
Clay	2.4

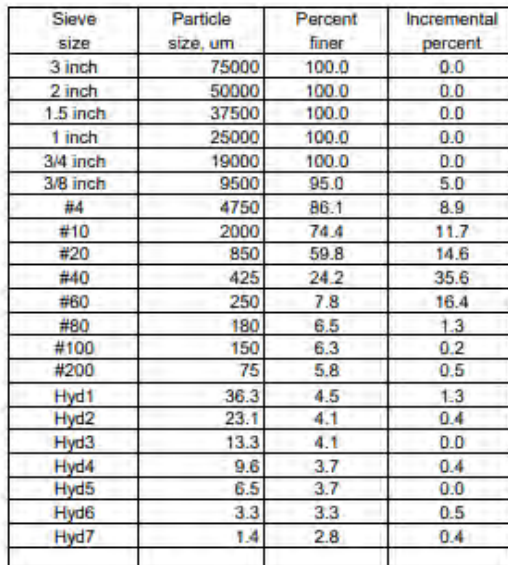
Sample ID:	SB24PW11S-53-55	Percent Solids:	81.3%	Date Received:	2/23/2024
Lab ID:	400-251671-A-2	Specific Gravity:	2.650	Start Date:	2/29/2024
				End Date:	3/11/2024

Hardness (> #10): hard

[illegible]

Sample ID: SB24TPZ10-37-39	Percent Solids: 88.4%	Date Received: 2/23/2024
Lab ID: 400-251671-A-3	Specific Gravity: 2.650	Start Date: 2/29/2024
		End Date: 3/11/2024

Hardness (> #10): hard

[illegible]

Particle Size of Soils by ASTM D422

Sample ID: SB24-04A-42-44
 Lab ID: 400-252725-A-5

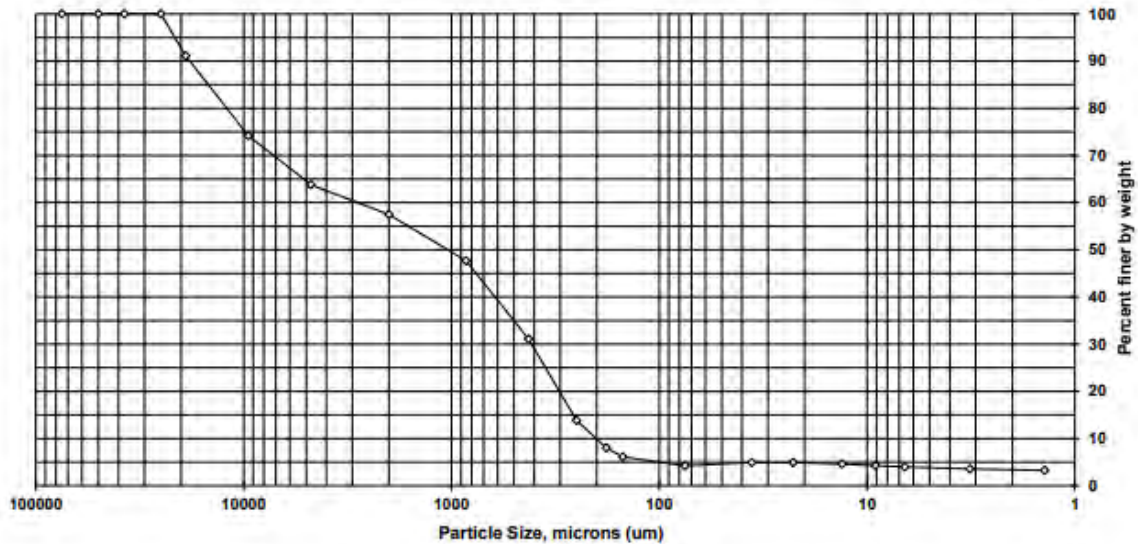
Percent Solids: 83.8%
 Specific Gravity: 2.650

Date Received: 3/14/2024
 Start Date: 3/18/2024
 End Date: 3/27/2024

Shape (> #10): rounded

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	91.1	8.9
3/8 inch	9500	74.2	16.9
#4	4750	63.8	10.4
#10	2000	57.5	6.3
#20	850	47.7	9.8
#40	425	31.1	16.6
#60	250	13.8	17.3
#80	180	8.0	5.8
#100	150	6.1	1.9
#200	75	4.2	1.9
Hyd1	35.9	4.9	-0.7
Hyd2	22.7	4.9	0.0
Hyd3	13.2	4.6	0.3
Hyd4	9.1	4.3	0.3
Hyd5	6.6	4.0	0.3
Hyd6	3.2	3.6	0.4
Hyd7	1.4	3.3	0.3

Soil Classification	Percent of sample
Gravel	36.2
Sand	59.6
Coarse Sand	6.3
Medium Sand	26.4
Fine Sand	26.9
Silt	0.3
Clay	4.0



Particle Size of Soils by ASTM D422

Sample ID: SB24-04A-56-58
 Lab ID: 400-252725-A-6

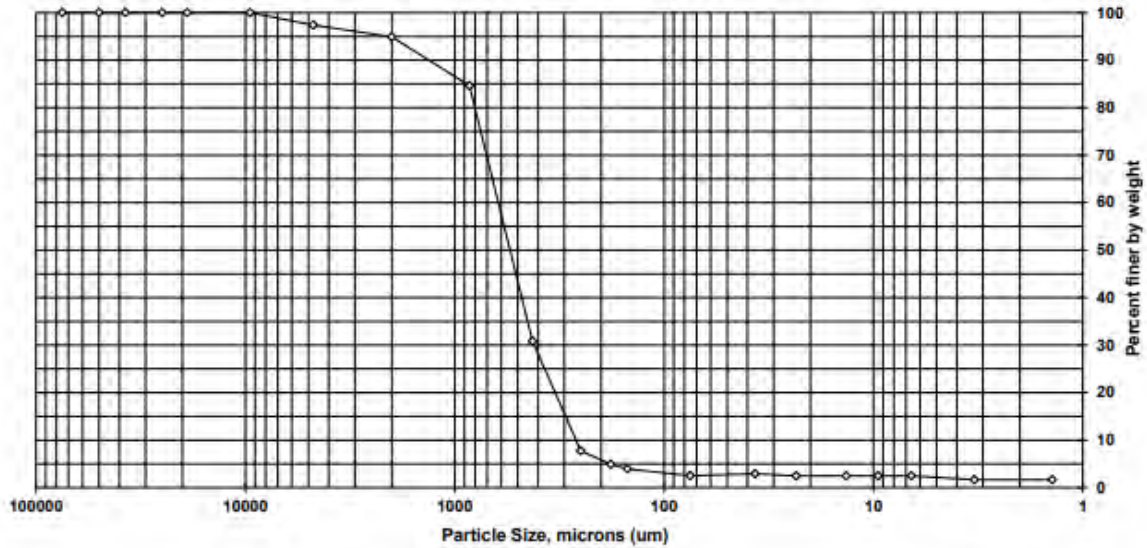
Percent Solids: 79.4%
 Specific Gravity: 2.650

Date Received: 3/14/2024
 Start Date: 3/18/2024
 End Date: 3/27/2024

Shape (> #10): rounded

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	97.4	2.6
#10	2000	94.9	2.5
#20	850	84.6	10.3
#40	425	30.8	53.8
#60	250	7.7	23.1
#80	180	4.9	2.8
#100	150	4.0	1.0
#200	75	2.5	1.4
Hyd1	36.8	2.9	-0.4
Hyd2	23.4	2.5	0.4
Hyd3	13.5	2.5	0.0
Hyd4	9.5	2.5	0.0
Hyd5	6.6	2.5	0.0
Hyd6	3.3	1.7	0.8
Hyd7	1.4	1.7	0.0

Soil Classification	Percent of sample
Gravel	2.6
Sand	94.9
Coarse Sand	2.5
Medium Sand	64.1
Fine Sand	28.3
Silt	0.0
Clay	2.5



Particle Size of Soils by ASTM D422

Sample ID: SB24-04A-66-68
 Lab ID: 400-252725-A-7

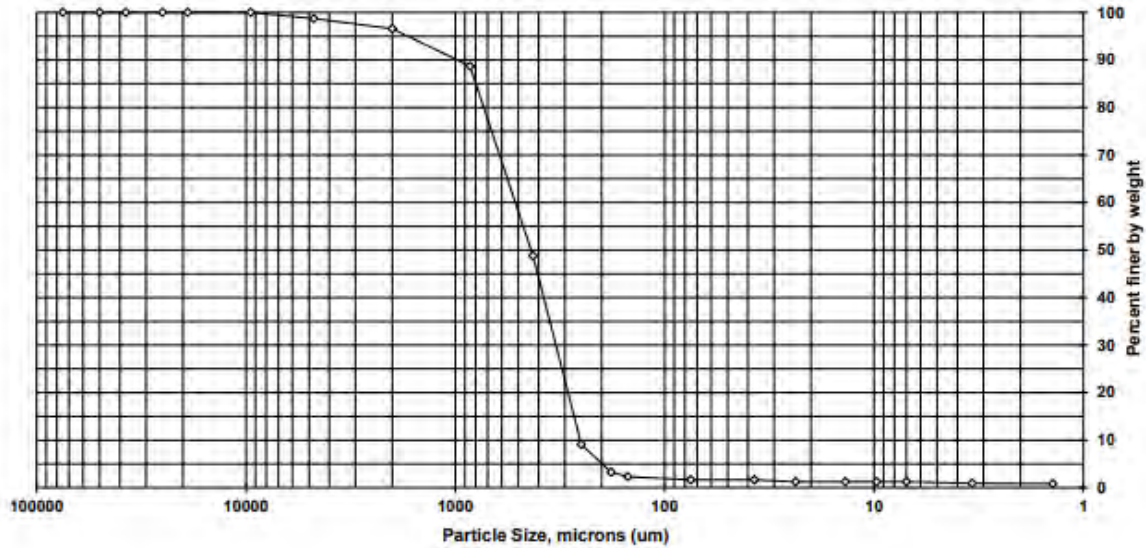
Percent Solids: 82.8%
 Specific Gravity: 2.650

Date Received: 3/14/2024
 Start Date: 3/18/2024
 End Date: 3/27/2024

Shape (> #10): rounded

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	98.7	1.3
#10	2000	96.6	2.1
#20	850	88.7	7.9
#40	425	48.8	39.9
#60	250	9.1	39.7
#80	180	3.2	5.9
#100	150	2.3	0.9
#200	75	1.7	0.7
Hyd1	37.3	1.7	0.0
Hyd2	23.7	1.2	0.4
Hyd3	13.7	1.2	0.0
Hyd4	9.7	1.2	0.0
Hyd5	7	1.2	0.0
Hyd6	3.4	0.9	0.3
Hyd7	1.4	0.8	0.1

Soil Classification	Percent of sample
Gravel	1.3
Sand	97.1
Coarse Sand	2.1
Medium Sand	47.8
Fine Sand	47.2
Silt	0.4
Clay	1.2



Particle Size of Soils by ASTM D422

Sample ID: SB24-04A-74-76
 Lab ID: 400-252725-A-8

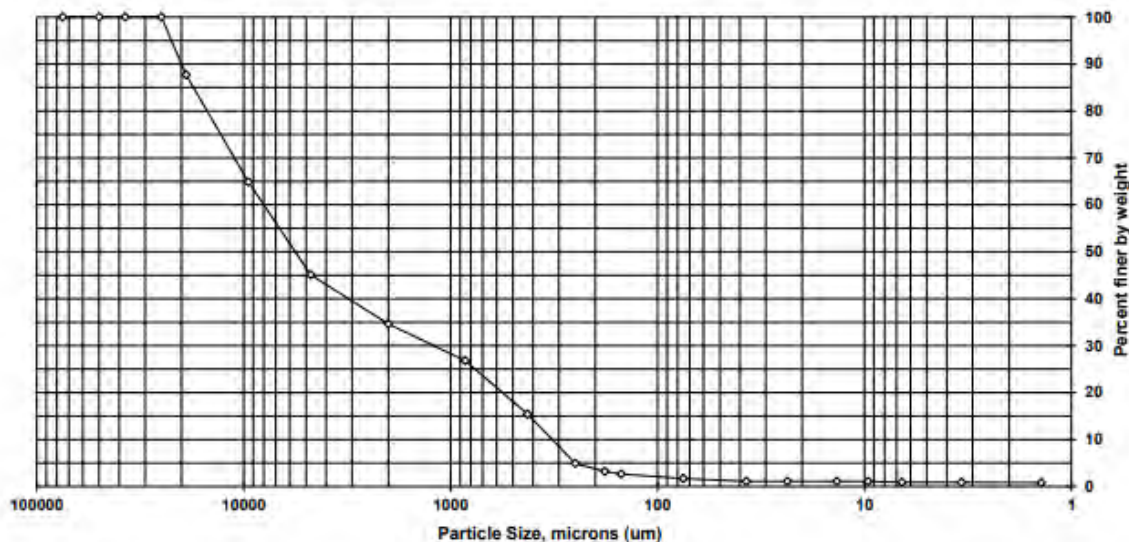
Percent Solids: 89.1%
 Specific Gravity: 2.650

Date Received: 3/14/2024
 Start Date: 3/18/2024
 End Date: 3/27/2024

Shape (> #10): rounded

Non-soil material: glass

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	87.7	12.3
3/8 inch	9500	64.9	22.8
#4	4750	45.1	19.8
#10	2000	34.6	10.5
#20	850	26.8	7.8
#40	425	15.4	11.4
#60	250	4.9	10.5
#80	180	3.2	1.7
#100	150	2.6	0.5
#200	75	1.7	1.0
Hyd1	37.3	1.1	0.6
Hyd2	23.6	1.1	0.0
Hyd3	13.6	1.1	0.0
Hyd4	9.6	1.1	0.0
Hyd5	6.6	0.9	0.2
Hyd6	3.4	0.9	0.0
Hyd7	1.4	0.8	0.1

Soil Classification	Percent of sample
Gravel	54.9
Sand	43.4
Coarse Sand	10.5
Medium Sand	19.2
Fine Sand	13.7
Silt	0.8
Clay	0.9



Particle Size of Soils by ASTM D422

Sample ID: SB24-04A-83-85
 Lab ID: 400-252725-A-9

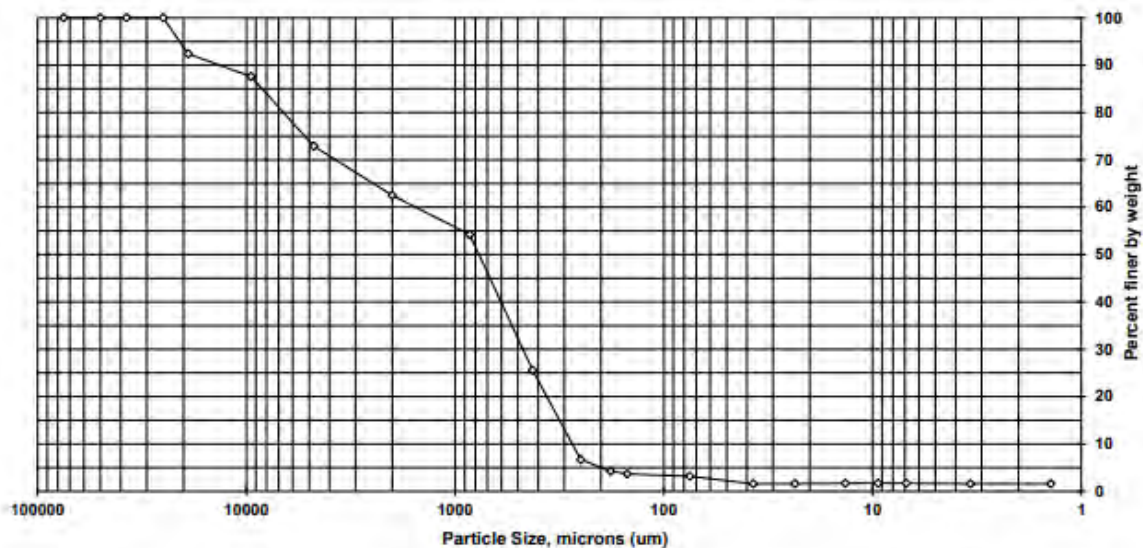
Percent Solids: 87.3%
 Specific Gravity: 2.650

Date Received: 3/14/2024
 Start Date: 3/18/2024
 End Date: 3/27/2024

Shape (> #10): rounded

Non-soil material: na

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	92.4	7.6
3/8 inch	9500	87.6	4.8
#4	4750	72.9	14.7
#10	2000	62.5	10.4
#20	850	54.2	8.3
#40	425	25.6	28.6
#60	250	6.7	18.9
#80	180	4.3	2.4
#100	150	3.6	0.6
#200	75	3.2	0.5
Hyd1	37.3	1.6	1.6
Hyd2	23.6	1.6	0.0
Hyd3	13.5	1.7	-0.1
Hyd4	9.4	1.7	0.0
Hyd5	6.9	1.7	0.0
Hyd6	3.4	1.6	0.1
Hyd7	1.4	1.6	0.0

Soil Classification	Percent of sample
Gravel	27.1
Sand	69.7
Coarse Sand	10.4
Medium Sand	36.9
Fine Sand	22.4
Silt	1.5
Clay	1.7



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ATTACHMENT B
LimnoTech, January 2025
Work Plan for Miocene Clay Sand Lens Investigations
(Western Upland Area)
for the BASF McIntosh, AL Site (ALD 001 221 902)

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Work Plan for Miocene Clay Sand Lens Investigations (Western Upland Area)

for the BASF McIntosh, AL Site (ALD 001 221 902)

Prepared for:
BASF

January 2025

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**Work Plan for Miocene Clay Sand Lens Investigations
(Western Upland Area)
for the BASF McIntosh, AL Site
(ALD 001 221 902)**

January 2025

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1 Introduction

The BASF McIntosh Site (“the Site”, RCRA Permit number ALD 001 221 902) is located in McIntosh, Alabama, approximately 50 miles north of Mobile, Alabama ([Figure 1](#)). The BASF Corporation (BASF) acquired Ciba Specialty Chemicals Corporation in 2009 and is the current owner of the Site. This Work Plan describes proposed additional onsite activities in the southwestern upland area of the site to investigate the extent and distribution of recently discovered groundwater impacts associated with a sand lens within the Miocene Clay interval.

Groundwater quality has been monitored at the McIntosh facility since 1981, consistent with Resource Conservation and Recovery Act (RCRA) mandates. A Corrective Action Plan (CAP) was developed and implemented in 1985, as specified under 40 CFR 264.100 and ADEM Admin. Code R 335-14-5-.06(11), “Releases for Solid Waste Management Units”, when contaminants were identified in the uppermost (i.e., Alluvial) aquifer. The CAP subsequently was included in the RCRA Permit issued in October 1985. The Plan has been the basis for Corrective Action required by the regulations and has been revised, as required, to address on-going evaluations of effectiveness. Details of the sampling program are provided in Appendix L of the RCRA Permit (“*Groundwater Corrective Action Program*”, updated August 2023). The CAP addresses the contamination identified in the uppermost (Alluvial) aquifer and the underlying (Upper Miocene) aquifer separately, to protect human health and the environment through preventing the migration of contaminants to receptors and controlling the sources of releases to the aquifer.

The western upland area (refer to [Figure 2](#)) has been a focus of numerous field activities conducted from 2013 through 2024 to determine the source of chlorobenzene impacts in groundwater samples collected from Upper Miocene Aquifer boundary monitoring well MD-3B. As shown in [Figure 3](#), chlorobenzene concentrations in MD-3B groundwater samples increased above the 0.1 mg/l Groundwater Protection Standard (GWPS) starting in early 2009, just a few months after the closure of nearby monitoring well MD-3A. Subsequent investigations of MD-3B and the surrounding area have demonstrated that the late 2008 closure of MD-3A likely provided a downward vector for impacted groundwater from a sand lens within the Miocene Clay to reach the underlying MD-3B well screen. Impacted groundwater samples from the Miocene Clay Sand Lens were discovered during the most recent phase of Vertical Aquifer Sampling (VAS) investigations conducted in 2024 (LimnoTech, August 2024).

The August 2024 Data Report that documented the most recent phased investigation results (LimnoTech, August 2024) was approved by ADEM on December 3, 2024. The ADEM approval letter stated the following (ADEM, 3 December 2024): “...*a plan detailing the proposed investigation of the sand lens discovered in the western uplands should be submitted within 30 days of the receipt of this letter.*” On December 19, 2024, BASF requested ADEM approval for an extension of the Work Plan



deadline to February 3, 2025 (BASF, 19 December 2024), which ADEM approved on December 20, 2024 (ADEM, 20 December 2024).

The remainder of this Work Plan describes the activities associated with additional onsite phased investigations of the extent and distribution of the Miocene Clay Sand Lens and associated groundwater quality sampling (Section 2). Surveying and investigation derived waste (IDW) management activities are described in Section 3. Data analysis and reporting activities are described in Section 4. References are provided in Section 5.



2 Alluvial and Miocene Clay Sand Lens Investigations

The source of increasing chlorobenzene impacts in Upper Miocene Aquifer Boundary monitoring well MD-3B groundwater samples has been under investigation since 2013. The results of Vertical Aquifer Sampling (VAS) investigations conducted in 2019, 2023 and 2024 show no clear indication of a significant Miocene Aquifer chlorobenzene plume emanating from the former OU2 former Original Effluent Impoundment (remediated Area 1) or the former OU2 Waste Disposal Pit (remediated Area 2) that would account for current impacts detected at Miocene well MD-3B. Historical Miocene Aquifer data, including those obtained from the 2019, 2023 and 2024 VAS investigations, suggest a correlation between the November 2008 MD-3A well closure/abandonment activities and chlorobenzene impacts in MD-3B groundwater samples.

A thick sand lens within the Miocene Clay interval (i.e., the Miocene Clay Sand Lens) has been observed in the boring logs at the MD-3A, MD-3B, SB24-06A/M, SB24-07A/M, SB24-08A/M and SBMIO19-3 locations at depths from approximately 105 ft to 165 ft below (refer to boring and well location map in [Figure 4](#) and boring logs in [Appendix A](#)). The sand lens appears to thin significantly progressively to the east, southeast and northeast where it transitions to one or several low yielding very fine to fine sand/silty sand and/or silt seams within the Miocene Clay at the SB24-05A/M, SB23-02A/M, SBMIO19-2, SBMIO19-1, MD-13 and MD-14 locations.

During the 2024 VAS investigations, chlorobenzene groundwater concentrations were detected above the 0.1 mg/l GWPS in groundwater samples collected from the Miocene Clay Sand Lens at borings located upgradient (SB24-08A/M) and downgradient (SB24-06A/M) of monitoring well MD-3B. As shown in [Figure 5](#), these exceedances were detected in the lower portion of the Miocene Clay Sand Lens, but there were no detections of chlorobenzene, or very low concentrations of chlorobenzene, in the shallower portion of the Miocene Clay Sand Lens, in overlying Alluvial Aquifer groundwater samples and in deeper groundwater samples collected from the Upper Miocene Aquifer. These results indicate that impacted groundwater from the Miocene Clay Sand Lens is sourcing MD-3B impacts, but that the extent of Upper Miocene Aquifer impacts is limited to the MD-3B location.

The goals of the additional data collection efforts described in this section are to further investigate the Miocene Clay Sand Lens extent and distribution to the north and west of MD-3B and determine groundwater flow direction within the Miocene Clay Sand Lens. In addition, Alluvial Aquifer and Miocene Clay Sand Lens groundwater quality data will be collected to assess potential sources to impacts that may be detected within these aquifers. The investigation area is outlined in [Figure 6](#) and will include the following activities:

- VAS of the Alluvial Aquifer and Miocene Clay Sand Lens (if present) at up to eight locations southwest, northwest and north of the MD-3B monitoring well to collect additional groundwater quality data and determine the extent of the Miocene Clay Sand Lens. The number and locations of VAS boring may be modified in the field as data are gathered.



- Install a minimum of three, and up to five, monitoring wells within the Miocene Clay Sand Lens to determine groundwater flow direction and groundwater levels relative to the overlying Alluvial Aquifer and underlying Upper Miocene Aquifer.
- Maintain continuous monitoring of groundwater levels in Upper Miocene wells WW-1, WW-2, WW-7, MD-3B, MD-13 and MD-14 for assessing the ongoing influence of Olin's Miocene Aquifer withdrawals on the Upper Miocene Aquifer potentiometric surface and its influence, if any, on Miocene Clay Sand Lens groundwater levels.

The overall sampling approach, field screening and laboratory analyses, and waste management will be consistent with the 2024 VAS investigation activities, as approved by ADEM (ADEM, August 5, 2024) and documented in the 2023 Sampling & Analysis Plan (LimnoTech, September 18, 2023 and July 2024) and 2024 VAS Data Report (LimnoTech, August 2024). The various field components are described more fully in the following subsections.

2.1 Vertical Aquifer Sampling of Alluvial and Miocene Clay Sand Lens Intervals

Additional VAS of the Alluvial Aquifer and Miocene Clay Sand Lens will be conducted at up to eight locations southwest, northwest and north of the MD-3B monitoring well (refer to [Figure 7](#)). The VAS activities will be conducted with a sonic drill rig and will include:

- The surficial clay and Alluvial intervals will be sampled continuously for physical characterization and field screening for the possible presence of DNAPL in extracted core samples down to the top of the Miocene Clay (approximately 90 ft below grade).
- Sampling of the Alluvial Aquifer will be conducted at 10 ft intervals. This is expected to start approximately 30 to 40 ft below grade and end above the top of the Miocene Clay at approximately 90 ft below grade.
- The Miocene Clay interval will be sampled continuously for physical characterization and field screening for the possible presence of DNAPL down to a maximum depth of 170 ft below grade.
- If encountered, the Miocene Clay Sand Lens will be sampled continuously for physical characterization and field screening for the possible presence of DNAPL until the Miocene Clay is again encountered, to an expected maximum depth of 170 ft below grade.
- If encountered, VAS of the Miocene Clay Sand Lens will be conducted at 10 ft intervals starting approximately 105 ft below grade to an expected maximum depth of 160 ft below grade.
- General water quality data will be collected as each groundwater sample interval is purged prior to sampling. This will include monitoring of residual rhodamine dye concentrations; a dilute solution of rhodamine dye will be added to the drilling water to assess the effectiveness of the purge prior to sampling.
- Sampling of the top of the Miocene Clay for laboratory analysis.



- Soil cuttings will be drummed and a composite soil sample will be collected from each boring location for TCLP analyses. Soil waste will be properly disposed pending the results of the TCLP analyses.

2.2 Supplemental Sampling for Water Quality Data to Support Potential In-Situ Corrective Actions

Miocene Clay Sand Lens VAS intervals will be sampled for supplemental groundwater quality data to support potential in-situ remediation if future corrective actions are deemed necessary. The additional groundwater quality samples will be analyzed for total and dissolved iron and manganese, sulfate, nitrate, TOC, COD, BOD, alkalinity and methane.

2.3 Analytical Methods

Groundwater and Miocene Clay soil samples will be analyzed by Eurofins for the organic and inorganic compounds listed in [Table 1](#).

2.4 Installation and Sampling of Miocene Clay Sand Lens Monitoring Wells

A minimum of three and no more than five monitoring wells will be installed in the Miocene Clay Sand Lens interval. Two of the monitoring well locations will be situated within 10 ft of existing Alluvial Aquifer monitoring wells OW-11 and SW-3 (refer to [Figure 7](#)). These locations were selected based on the results from the 2024 VAS investigation, which showed chlorobenzene impacts above the 0.1 mg/l GWPS in Miocene Clay Sand Lens groundwater samples from nearby borings SB24-08A/M and SB24-06A/M. The new monitoring wells will be designated MCSL-OW-11 and MCSL-SW-3 because they will serve as clustered monitoring wells to the OW-11 and SW-3 wells, respectively.

At least one more monitoring well (up to a maximum of three additional monitoring wells) will be installed based on the results of the VAS investigation described above. The location (s) of the additional well(s) will be based on whether the Miocene Clay Sand Lens is encountered at sufficient thickness and yield in one or more of the exploratory VAS borings. Ideally, at least one more monitoring well can be positioned so that it triangulates with the new MCSL-OW-11 and MCL-SW-3 monitoring wells to determine groundwater flow direction within the Miocene Clay Sand Lens.

The vertical placement of new monitoring well screen intervals will be based primarily on the maximum detected concentration of chlorobenzene impacts within the vertically profiled Miocene Clay Sand Lens interval. At the proposed MCSL-OW-11 and MCL-SW-3 locations, the screen intervals will be 10 ft long and span from approximately 148 to 158 ft below grade and from 150 to 160 ft below grade, respectively, where chlorobenzene groundwater concentrations ranged from 1.0 to 3.8 mg/l at the SB24-08A/M boring and from 0.40 to 0.25 mg/l at the SB24-06A/M boring. Other compounds such as strontium and/or vanadium, arsenic and benzene also exceeded GWPS at the SB24-06A/M and SB24-08A/M locations; consequently, detected concentrations of these additional compounds may also be used to guide screen placement for the additional one to three monitoring wells. If no groundwater impacts are detected within the Miocene Clay Sand Lens at the proposed VAS investigation boring



locations, then screen placement will be targeted to the lowest 10 ft within the logged Miocene Clay Sand Lens at the selected monitoring well location(s).

If the Miocene Clay Sand Lens is not encountered in any of the proposed VAS boring locations, or if it is logged as thin, low-yielding, very fined-grained/silty intervals, then a field decision will be made regarding the viability of installing a third monitoring well at one of these locations. Alternatively, a third monitoring well may be installed near the SB24-07A/M location (located approximately 180 ft west of the SB24-06A/M boring) where the Miocene Clay Sand Lens is thinner and where chlorobenzene impacts were detected at concentrations of 0.0055 to 0.012 mg/l from approximately 136 to 148 ft below grade. There also were exceedances of the arsenic, strontium and vanadium GWPS in this groundwater interval.

Monitoring well construction will be as follows:

- A minimum 8-inch diameter borehole to accommodate a 4-inch diameter well casing and screen.
- All well screen and inner casing materials will be made of Schedule 40 PVC.
- Well screen intervals will be 4-inches in diameter, 10-slot, and span 10 ft based on the field evaluation protocols described above. If a field decision is made to span a low-yielding fine-grained interval, the screens will be 7-slot and lengths may be reduced to 5 ft.
- If necessary for proper screen placement, the drill stem will be extracted to allow the borehole to collapse naturally below the designated screen interval.
- The annulus between the borehole and the well screen will be filled with appropriately sized clean filter sand, from the bottom of the well screen to at least 3 ft above the top of the screened interval.
- At least 3 ft of bentonite seal will be placed above the top of the sand filter pack. If bentonite pellets are used above the sand pack, they will be allowed to hydrate for at least one hour before the annulus is grouted.
- The remainder of the borehole annulus around the well casing will be tremie-grouted to grade, starting from the top of the bentonite seal.
- Unless site conditions dictate a flush-mount well, all monitoring well casings will be cut off at least 2 feet above grade and will be equipped with compression well caps.
- A steel protective casing with a lockable cap will be installed at each location and will be seated in a cement pad that measures approximately 2 ft by 2 ft.
- Bollards will be installed around each well as appropriate based on site traffic conditions.
- Each well will be labeled as required per the current RCRA permit.
- The wells will be properly developed using a surge method a minimum of 24 hours after each monitoring well is installed.



3 Surveying and Management of Investigation Derived Waste (IDW)

Following the completion of boring and monitoring well installation activities, the location coordinates will be surveyed by a licensed surveyor along with the top of casing reference for groundwater level monitoring at each monitoring well. Horizontal coordinates will be in State Plane NAD83 Alabama West Zone. Vertical coordinates will be based upon NAVD88 and GEIOD18.

All purged groundwater and decontamination water will be drummed for proper disposal at the onsite wastewater treatment plant.

Soil cuttings will be drummed and a composite soil sample will be collected from each boring location for TCLP analyses. Soil waste will be properly disposed pending the results of the TCLP analyses.



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4 Data Analysis and Reporting

A data report will be submitted to ADEM following the completion of boring and monitoring well field activities and within 60 days of the receipt and review of final laboratory and survey data.

Following ADEM review and approval of the investigation report findings, quarterly monitoring of the newly installed monitoring wells will begin in accordance with the requirements specified in the December 2023 RCRA permit. The new Miocene Clay Sand Lens monitoring wells will be monitored for depth to groundwater data and sampled for groundwater quality data in accordance with the annual list of Alluvial Aquifer analytes. This information will be included in quarterly reports to ADEM for a minimum of 2 years to establish baseline conditions for Miocene Clay Sand Lens groundwater, at which time the monitoring frequency and analyte list will be re-evaluated with ADEM.



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5 References

- Alabama Department of Environmental Management (ADEM), 20 December 2024. Letter from Austin Pierce (ADEM) to Steve Havlik (BASF), RE: Work Plans Required by ADEM, BASF Corporation, McIntosh, Washington County, Alabama, USEPA I.D. Number ALD 001 221 902.
- Alabama Department of Environmental Management (ADEM), 3 December 2024. Approval letter from Austin Pierce (ADEM) to Steve Havlik (BASF), RE: Data Report: Additional Vertical Aquifer Sampling (VAS) Investigations of Alluvial and Miocene Aquifer Groundwater, BASF Corporation, McIntosh, Washington County, Alabama, USEPA I.D. Number ALD 001 221 902.
- Alabama Department of Environmental Management (ADEM), 5 August 2024. Response to Comments: Revisions to 2023 Groundwater Sampling & Analysis Plan (SAP), BASF Corporation, Washington County, Alabama, USEPA I.D. Number ALD 001 221 902.
- Alabama Department of Environmental Management (ADEM), 6 June 2024. Comments to 2023 Groundwater Sampling & Analysis Plan, BASF Corporation, Washington County, Alabama, USEPA I.D. Number ALD 001 221 902.
- Alabama Department of Environmental Management (ADEM), 25 January 2024. 2023 Groundwater SAP Preliminary Response, Email from Ben King (ADEM) to Steve Havlik (BASF) regarding conditional approval of September 2023 Draft Groundwater Sampling & Analysis Plan.
- Alabama Department of Environmental Management (ADEM), December 21, 2023. BASF Corporation Hazardous Waste Facility Permit, US EPA ID Number ALD 001 221 902.
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- Alabama Department of Environmental Management (ADEM), March 9, 2020. Approval letter to January 2, 2020 Vertical Aquifer Sampling (VAS) Investigation of Miocene Aquifer Groundwater Report, BASF Corporation, McIntosh, Washington County, Alabama, USEPA ID Number ALD 001 221 902.
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- Alabama Department of Environmental Management (ADEM), May 10, 2017. Hazardous Waste Facility Permit, BASF Corporation, McIntosh, AL.
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Miocene Aquifer Groundwater BASF Corporation, McIntosh, Washington County, Alabama, USEPA I.D. Number ALD 001 221 902.

LimnoTech, 21 August 2024, Data Report: Additional Vertical Aquifer Sampling (VAS) Investigations of Alluvial and Miocene Aquifer Groundwater. BASF McIntosh, AL (US EPA ID Number ALD 001 221 902).

LimnoTech, July 2024. Revision 1 to the September 2023 Groundwater Sampling & Analysis Plan for the BASF McIntosh, AL Site (ALD 001 221 902).

LimnoTech, 18 September 2023. 2023 Groundwater Sampling & Analysis Plan for the BASF McIntosh, AL Site (ALD 001 221 902).

LimnoTech, 12 September 2023. Additional Vertical Aquifer Sampling (VAS) Investigations of Alluvial and Miocene Aquifer Groundwater to Address Chlorobenzene Impacts at Monitoring Well MD-3B, BASF McIntosh, AL (US EPA ID Number ALD 001 221 902).

LimnoTech, 17 November 2022. Work Plan for Additional Onsite Investigations of Potential Sources to MD-3B Groundwater Impacts, BASF McIntosh, AL (US EPA ID Number ALD 001 221 902).

LimnoTech, 2 January 2020. Vertical Aquifer Sampling (VAS) Investigations of Miocene Aquifer Groundwater to Address Chlorobenzene Impacts at Monitoring Wells MD-3B, MD-2 and MD-11, BASF McIntosh, AL (US EPA ID Number ALD 001 221 902).

LimnoTech, May 9, 2018. Work Plan for Additional Onsite Miocene Aquifer Investigations, BASF McIntosh, AL (US EPA ID Number ALD 001 221 902).



Table 1. Analytical Methods.

Parameter	Groundwater Method	Soil Method	Soil TCP Method
Metals (arsenic, cadmium, lead, strontium, vanadium)	SW846 6020B	SW846 6020B	SW846 6010D
Metals (mercury)			SW846 7470A
Metals (total and dissolved iron & manganese)^	Hach method or SW846 6020B		
Pesticides (A-BHC, B-BHC, D-BHC, G-BHC, 44-DDD, 44-DDE, 44-DDT, 24-DDD, 24-DDE, 24-DDT, aldrin, dieldrin, chlorobenzilate)	SW846 8081B	SW846 8081B	SW846 8081B
Herbicides (24-D, Silvex)			SW846 8151A
SVOCs (2-chlorophenol, 1,2-diphenylhydrazine, naphthalene, nitrobenzene)	SW846 8270E	SW846 8270E	SW846 8270E
VOCs (benzene, carbon tetrachloride, chlorobenzene, chloroform, 12-dichlorobenzene, 14-dichlorobenzene, 11-DCE, toluene, 124-trichlorobenzene, vinyl chloride)	SW846 8260D	SW846 8260D	SW846 8260D
Sulfate^	E375.3 or 9056		
Nitrate^	E353.1 or 9056		
Flashpoint			SW846 1010B
Reactive cyanide			SW846 9014
Reactive sulfide			SW846 9034
Corrosivity by pH			SW846 9045D
Total Organic Carbon^	E415.1 or 9060		
Biological Oxygen Demand^	SW846 5210B		
Chemical Oxygen Demand^	E410.1-.2		
Alkalinity^	E 310.2		
Methane^	ASTM D1945		
General water quality (temperature, pH, conductivity, dissolved oxygen, ORP, turbidity)	Field measurement YSI		

^ Applies to Miocene Clay Sand Lens groundwater samples only.



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Figure 1. BASF site map



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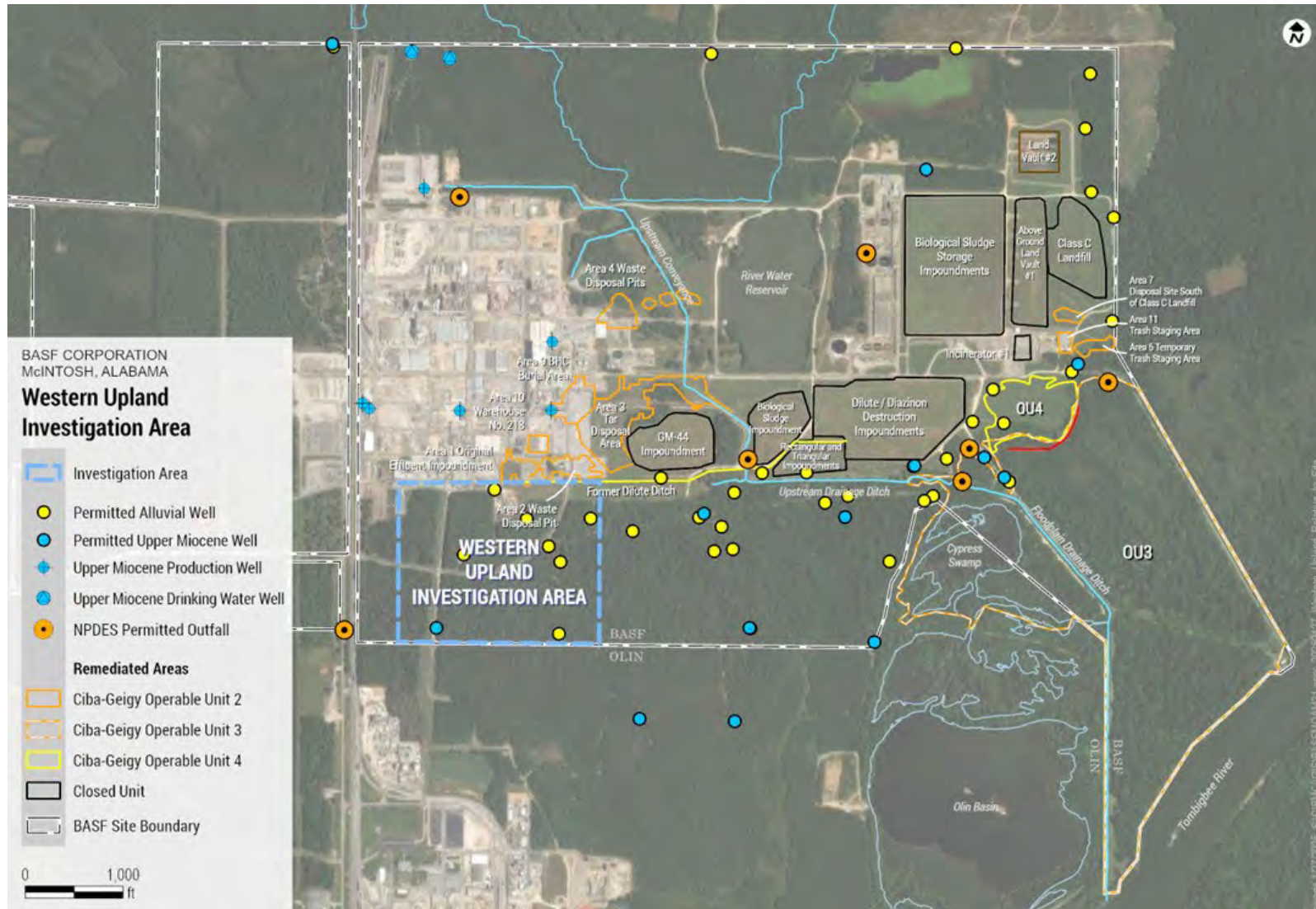


Figure 2. Western upland Investigation area.



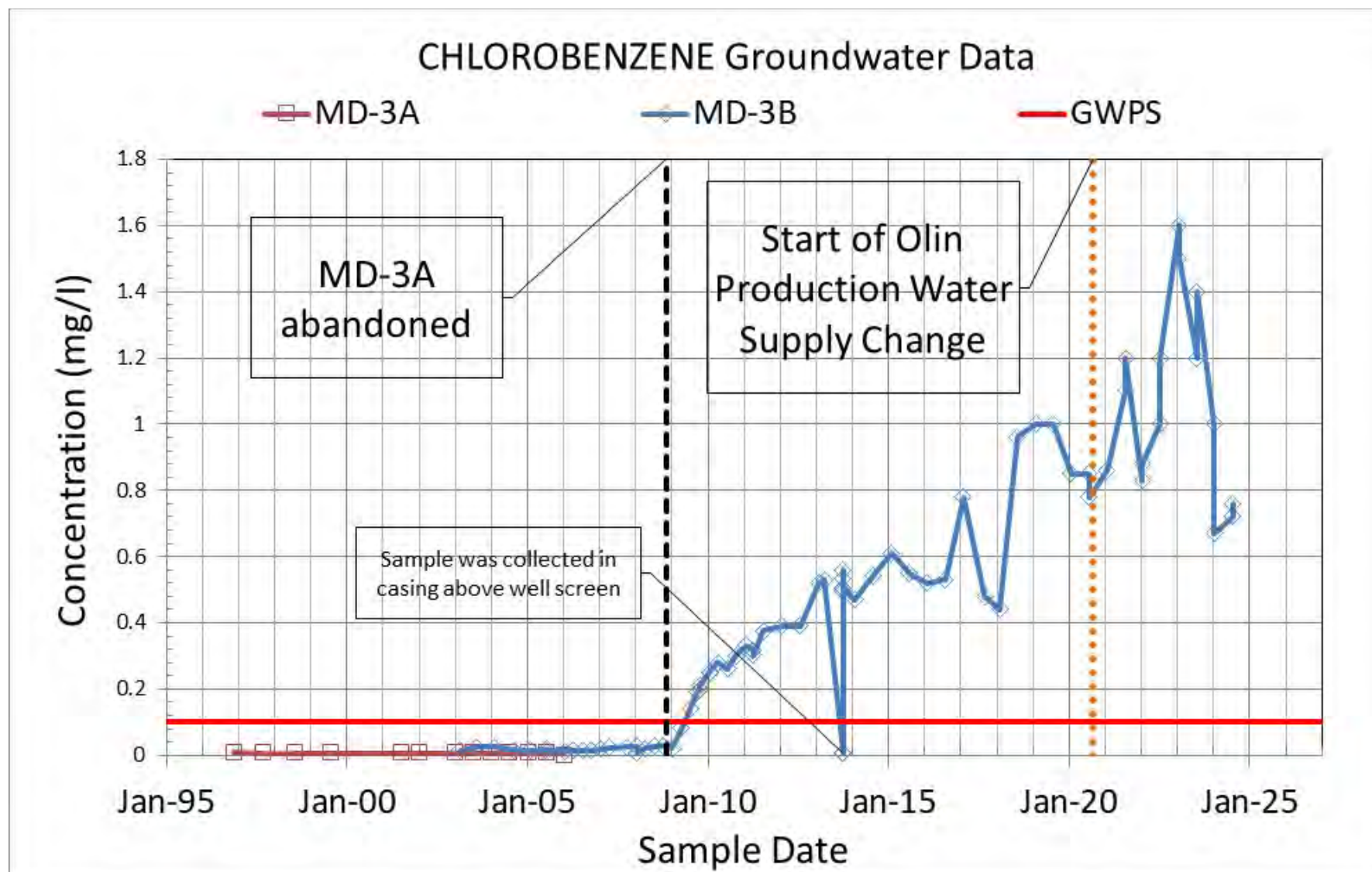


Figure 3. Time-series graph of chlorobenzene concentrations in Miocene Aquifer monitoring well MD-3B and former/closed monitoring well MD-3A.

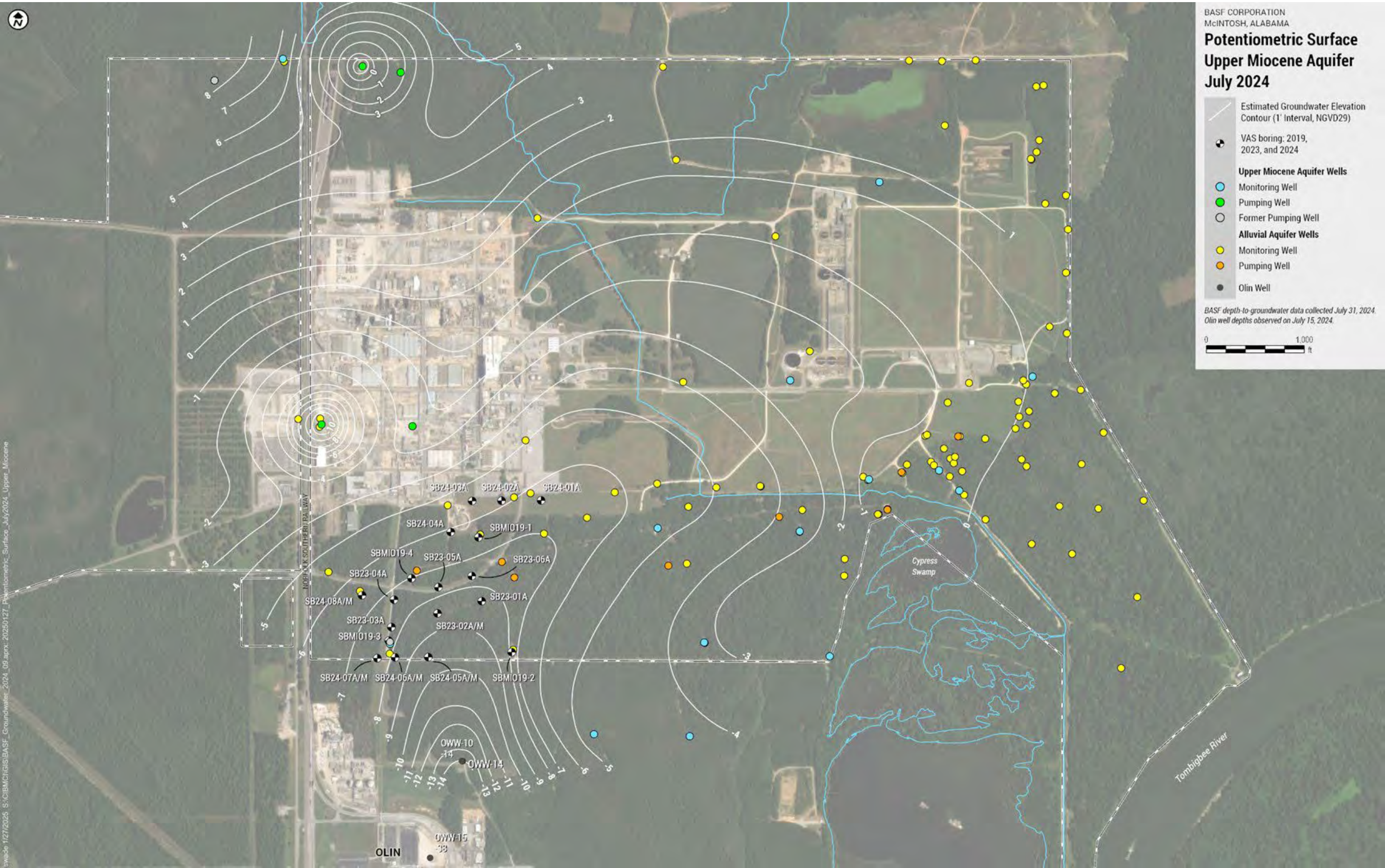


Figure 4. July 2024 Upper Miocene Aquifer groundwater elevation map and location map of 2019 through 2024 Western Upland Area VAS investigation borings.

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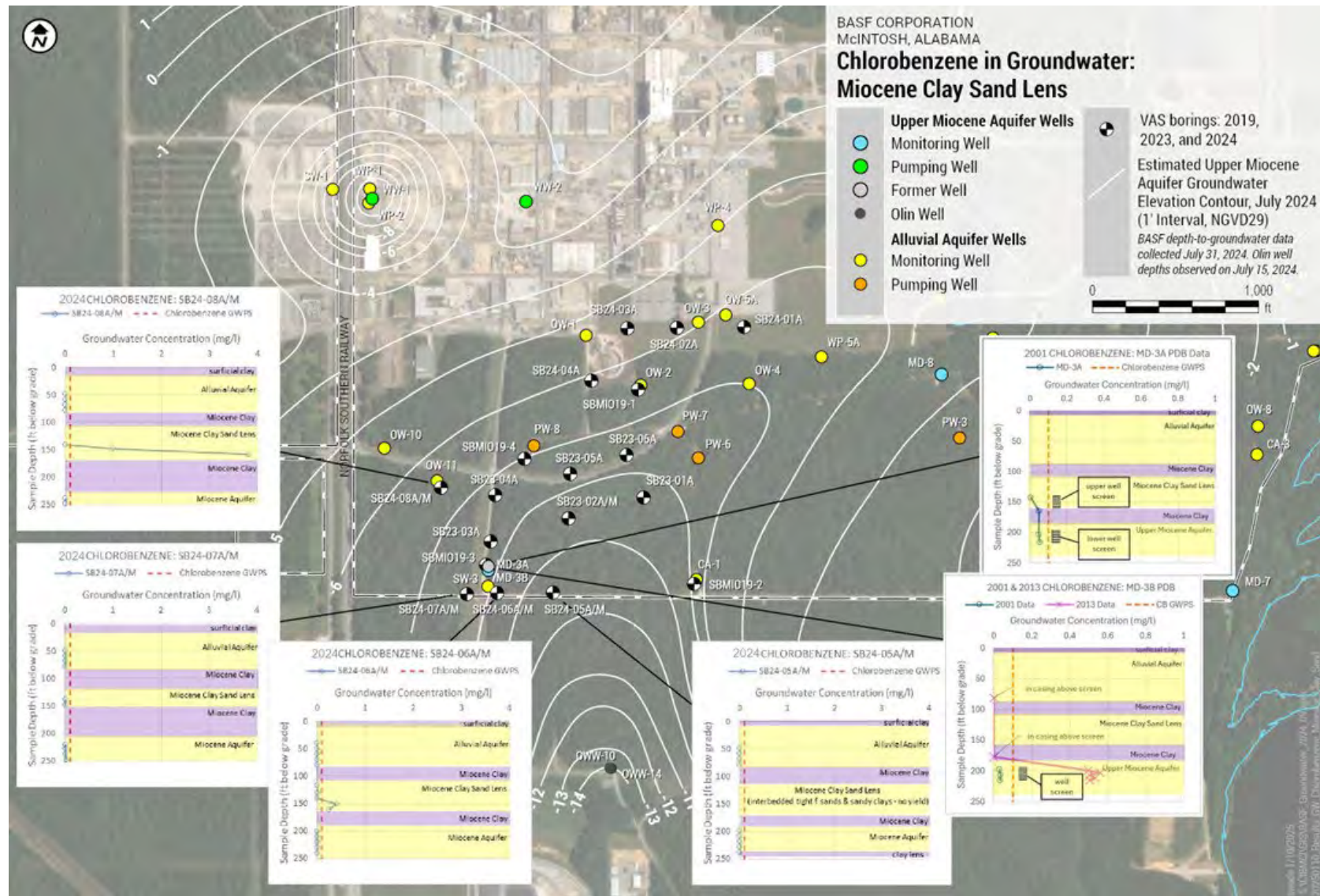


Figure 5. Vertical distribution of chlorobenzene concentrations in 2024 VAS borings, in 2001 MD-3A and MD-3B Passive Diffusion Bag (PDB) groundwater samples and in 2013 MD-3B PDB groundwater samples.

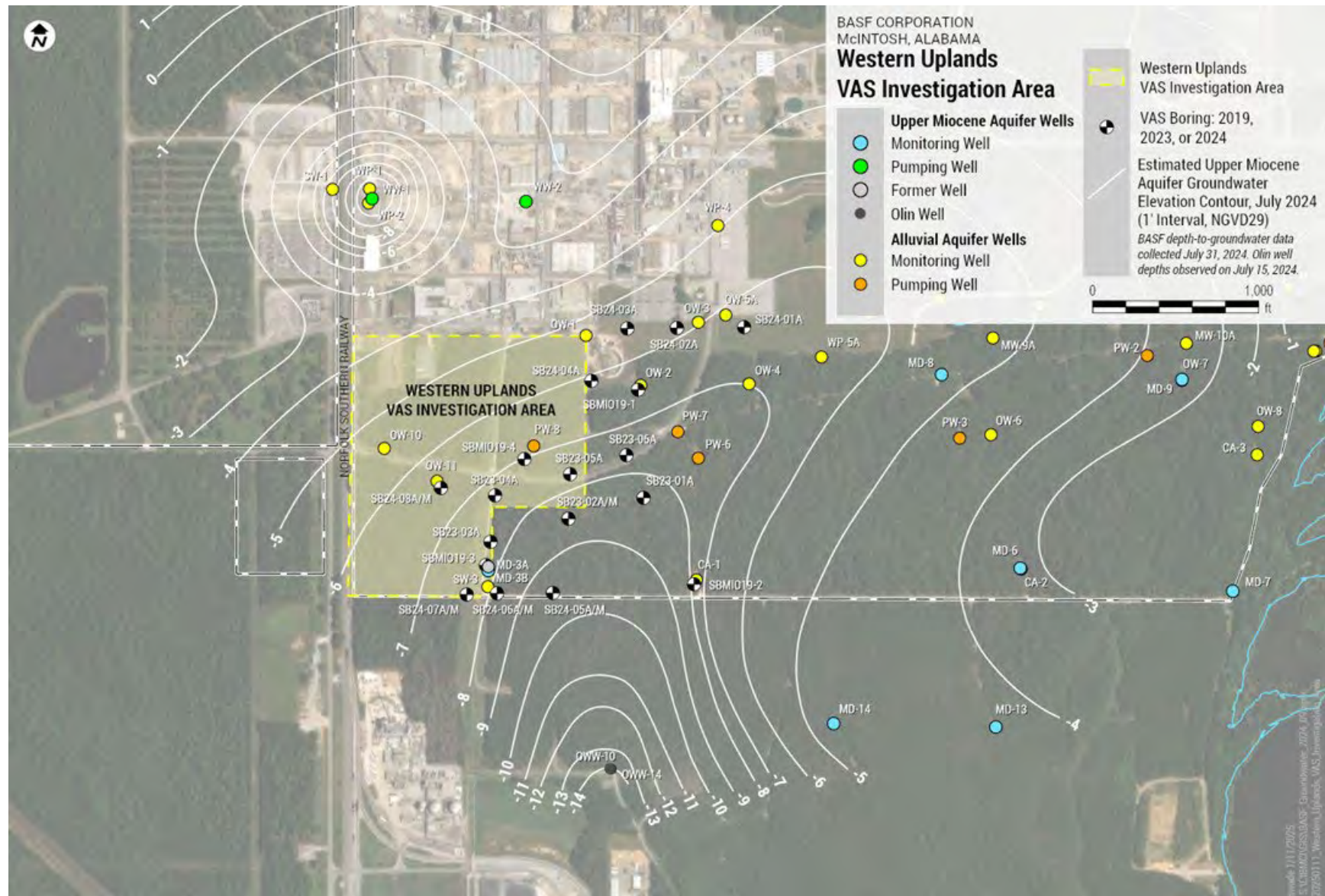
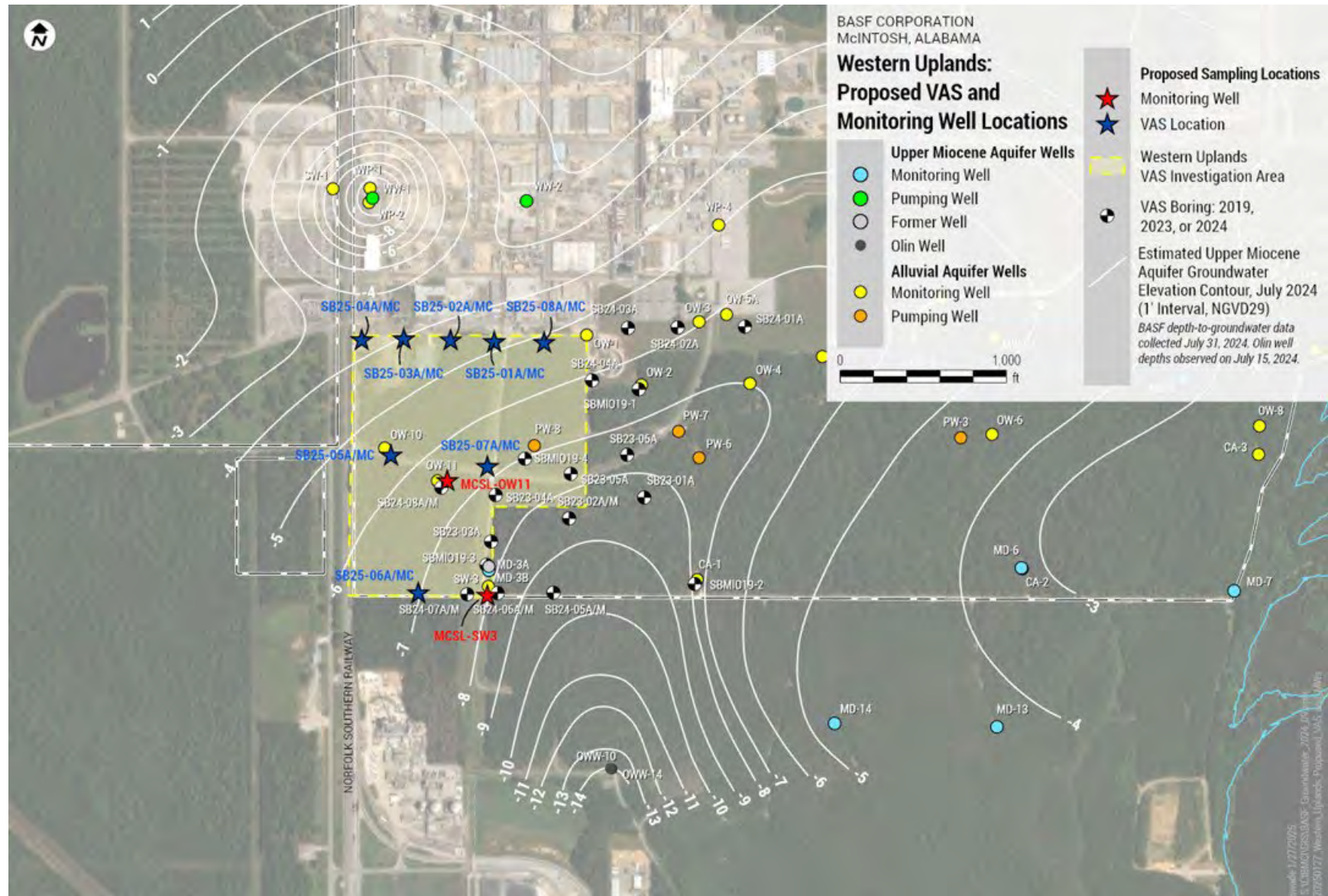


Figure 6. Outline of proposed VAS investigation area west and north of MD-3B.



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Appendix A. Boring Logs



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LITHOLOGIC DESCRIPTION, MD-3

OWNER: Ciba-Geigy Corporation

DATE DRILLED: January 27 - 30, 1984

PELA GEOLOGIST: Tom Schneider

{ NOTE: Corrections in depth intervals logged by geologist are adjusted to geophysical logs because of thick mud used in drilling. Hole abandoned February 8, 1984.

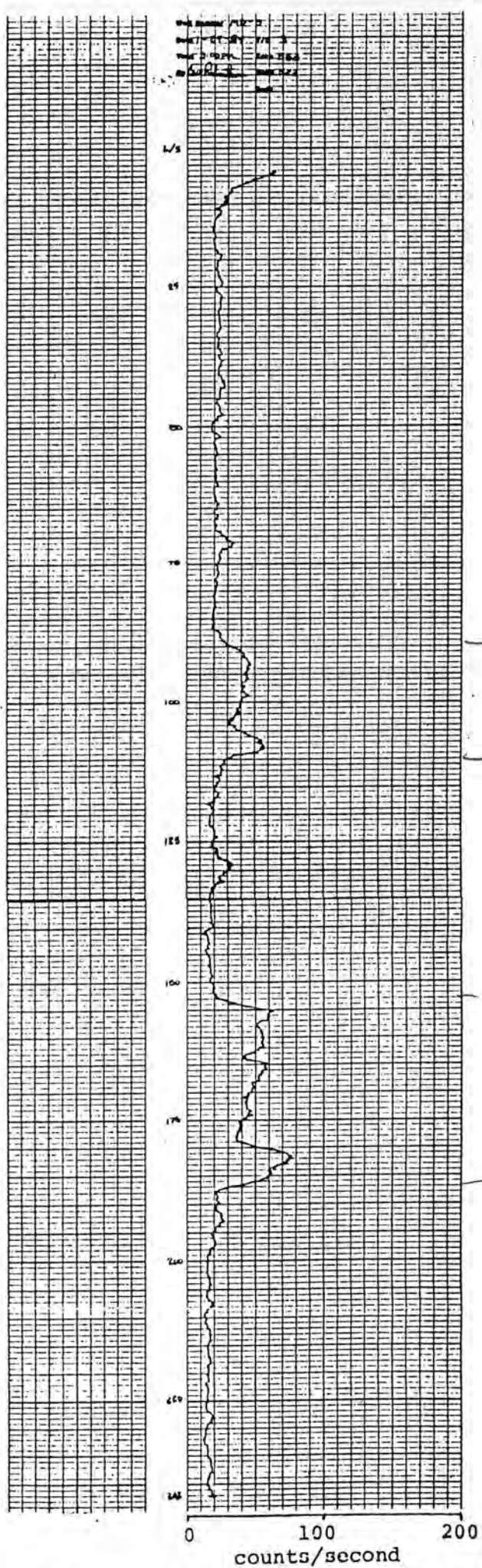
Depth (in feet)	Description
0 - 8.0	Clay, dark-yellowish-orange with moderate reddish-brown.
8.0 - 10.0	Sand, light-brown, clear quartz, medium-grained, sub-angular, clayey.
10.0 - 15.0	Sand, dark-yellowish-orange, clear quartz, medium- to coarse-grained, subrounded.
15.0 - 20.0	Sand, grayish-orange, clear quartz, medium- to coarse-grained, subangular.
20.0 - 35.0	Sand, grayish-orange, clear quartz, medium-grained, some coarse-grained, subangular.
35.0 - 40.0	Sand, grayish-orange, clear quartz, medium- to coarse-grained, subangular, trace of gravel, varicolored opaque, 2 to 5 mm in diameter.
40.0 - 45.0	Sand, grayish-orange, clear quartz, medium-grained, some coarse-grained, subangular.
45.0 - 50.0	
50.0 - 55.0	Sand, grayish-orange, clear quartz, medium- to coarse-grained, some very coarse-grained, gravelly, quartz and varicolored opaque, 2 to 20 mm in diameter, subangular.
55.0 - 60.0	Sand, grayish-orange, clear quartz, medium- to very coarse-grained, subangular, some moderate orange-pink chert grains and dark opaque grains, very coarse-grained, subangular to subrounded, minor gravel, as above, 2 to 15 mm in diameter.
60.0 - 65.0	Sand, grayish-orange, clear to white quartz, medium- to coarse-grained, subangular, minor gravel chert with some quartz, 2 to 10 mm in diameter, subrounded.

MD-3 (continued)

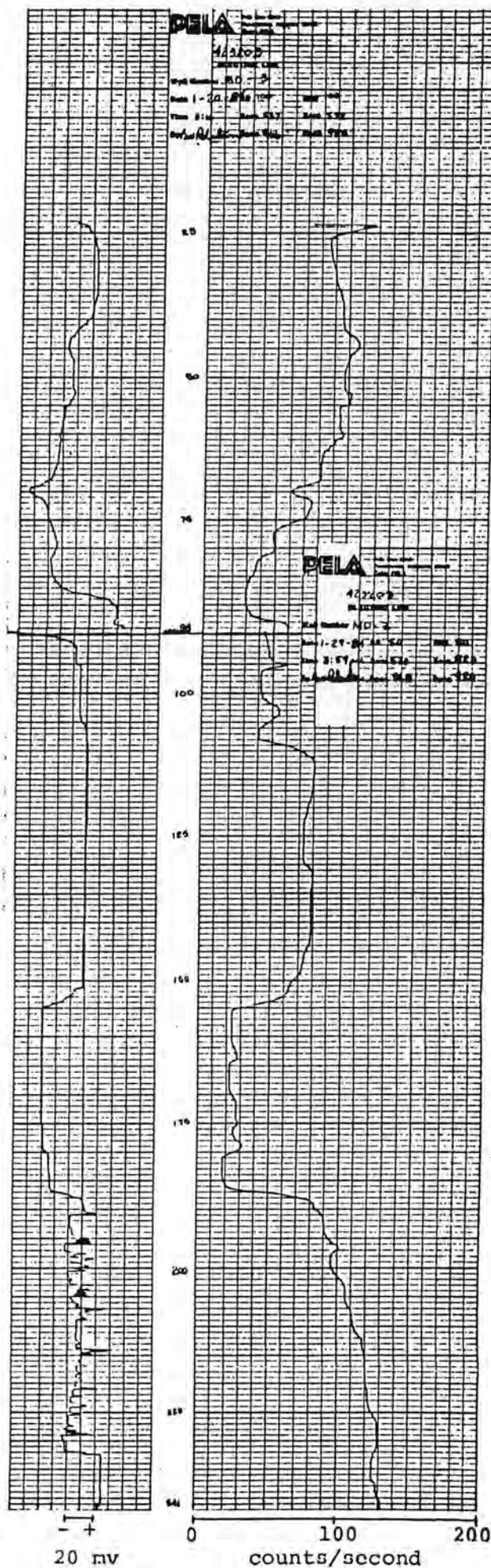
Depth (in feet)	Description
65.0 - 70.0	Sand, grayish-orange, clear to white quartz, medium- to coarse-grained, subangular, trace of gravel, as above, 2 mm in diameter, minor clay.
70.0 - 75.0	Sand, grayish-orange, clear to white quartz, medium- to coarse-grained, subangular, minor gravel, white quartz and varicolored opaque, 2 to 6 mm in diameter, slightly clayey.
75.0 - 80.0	Sand, grayish-orange, clear to white quartz, medium- to coarse-grained, minor gravel, white quartz, moderate yellowish-brown chert, 2 to 20 mm in diameter.
80.0 - 88.0	Sand, grayish-orange, clear to white quartz, medium- to coarse-grained, minor gravel, white quartz, chert, 2 to 6 mm in diameter.
88.0 - 100.0	Clay, yellowish-gray, silty, minor sand, clear quartz, medium-grained.
100.0 - 105.0	Clay, light-gray, silty, slightly sandy, clear quartz, fine- to medium-grained, subrounded.
105.0 - 110.0	Clay, light-gray, sandy, clear quartz, fine-grained, some medium-grained, subrounded, stiff.
110.0 - 130.0	Sand, light-gray, clear quartz and dark-yellowish-orange chert, medium- to coarse-grained, subrounded.
130.0 - 140.0	Sand, grayish-orange, clear quartz and chert, dark-yellowish-orange, fine- to coarse-grained, subangular to subrounded.
140.0 - 150.0	Sand, grayish-orange, clear to white quartz and chert, medium- to very coarse-grained, subangular to subrounded.
150.0 - 154.0	Sand, grayish-orange, clear quartz with minor chert, medium-grained.
154.0 - 160.0	Sand, grayish-orange, clear to white quartz, medium- to coarse-grained, subangular, minor dark opaque grains.
160.0 - 165.0	Clay, light-bluish-gray, soft, silty, slightly sandy, clear quartz, medium-grained.

MD-3 (continued)

Depth (in feet)	Description
165.0 - 180.0	Clay, light-bluish-gray with minor moderate brown, silty, slightly sandy to sandy, clear quartz, fine- to medium-grained, subrounded, increasing stiffness with depth.
180.0 - 185.0	Clay, same as above, stiff.
185.0 - 188.0	Clay, medium gray, silty, slightly sandy, clear quartz, fine- to medium-grained, subrounded.
188.0 - 190.0	Sand, grayish-orange, clear to white quartz, fine- to medium-grained, subangular.
190.0 - 205.0	Sand, grayish-orange, white quartz, medium-grained, subangular to subrounded.
205.0 - 210.0	Sand, same as above, minor gravel, quartz and chert, 2 to 5 mm in diameter.
210.0 - 215.0	Sand, same as above, minor gravel, as above, 2 to 10 mm in diameter.
215.0 - 220.0	Sand, same as above, minor gravel, as above, 2 to 5 mm in diameter.
220.0 - 230.0	Sand, yellowish-gray, clear to white quartz, medium-grained, subrounded to subangular, minor gravel, white quartz and varicolored and dark opaque, 2 to 10 mm in diameter.
230.0 - 235.0	Sand, yellowish-gray, clear quartz, medium- to coarse-grained, subangular to subrounded, minor gravel, as above.
235.0 - 240.0	Sand, yellowish-gray, clear quartz, medium- to coarse-grained, trace of dark opaque grains, medium-grained, minor gravel, as above.
240.0	TOTAL DEPTH.



Gamma log for MD-3: 4-242 feet below land surface



Electric log for MD-3: 24-241 feet below land surface

LITHOLOGIC DESCRIPTION, MD-3A

OWNER: Ciba-Geigy Corporation
 DATE DRILLED: February 9 - 11, 1984
 PELA GEOLOGIST: Dan O. Madison, Jr.

Depth (in feet)	Description
0 - 5.0	Clay, moderate reddish-brown to light-brown and yellowish-gray, silty, trace of sand, clear quartz, medium-grained, subangular.
5.0 - 10.0	Clay, yellowish-gray with minor moderate reddish-brown, silty, trace of sand, clear quartz, medium-grained, subangular.
10.0 - 25.0	Sand, dark-yellowish-orange, clear quartz, medium- to coarse-grained, subrounded.
25.0 - 30.0	Sand, grayish-orange, clear quartz, coarse-grained, few medium-grained, subrounded to subangular, trace of chert grains, dark-yellowish-orange, coarse-grained.
30.0 - 35.0	Sand, same as above, coarse-grained, trace of dark opaque grains, fine-grained.
35.0 - 40.0	Sand, grayish-orange, clear quartz, coarse- to very coarse-grained, subangular to subrounded, trace of dark opaque grains, fine-grained, trace of gravel, clear quartz and pale-yellowish-orange chert, 2 mm in diameter.
40.0 - 45.0	Sand, grayish-orange, clear quartz, coarse- to very coarse-grained, minor chert, dark-yellowish-orange, very coarse-grained, abundant gravel, clear to white quartz and dark-yellowish-orange chert, 3 to 4 mm in diameter, some up to 8 mm in diameter, subrounded to subangular.
45.0 - 50.0	Sand, same as above, gravel, as above, less abundant, minor clay, light-olive-gray, sandy, clear quartz, medium- to coarse-grained.
50.0 - 55.0	Sand, same as above, abundant gravel, as above, 4 to 12 mm in diameter.

MD-3A (continued)

Depth (in feet)	Description
55.0 - 60.0	Sand, grayish-orange, clear quartz, coarse- to very coarse-grained, subangular to subrounded, trace of chert gravel, dark-yellowish-orange, coarse-grained, minor gravel, clear to white quartz and dark-yellowish-orange chert, 3 to 6 mm in diameter.
60.0 - 65.0	Sand and gravel; sand, same as above; gravel, as above.
65.0 - 70.0	Sand, same as above, minor gravel, as above.
70.0 - 75.0	Sand, grayish-orange to very pale-orange, clear quartz, coarse- to very coarse-grained, trace of dark-yellowish-orange chert, subrounded to subangular, abundant gravel, clear to white quartz and dark-yellowish-orange chert, rounded, 4 to 15 mm in diameter.
75.0 - 80.0	Gravel, clear to white quartz and very pale-orange to dark-yellowish-orange chert, 4 to 10 mm in diameter, rounded, some sand, clear quartz, coarse- to very coarse-grained, subangular to subrounded.
80.0 - 87.0	Sand, same as above with gravel, as above.
87.0 - 100.0	Clay, light-gray, stiff, sandy, clear quartz, fine- to medium-grained, subangular to subrounded.
100.0 - 110.0	Clay, light-gray, silty, sandy, clear quartz, fine-grained.
110.0 - 115.0	Clay, yellowish-gray, very sandy, clear quartz, fine-grained.
115.0 - 120.0	Sand, yellowish-gray, clear quartz, medium- to coarse-grained, subrounded, trace of gravel, clear to white quartz and dark-yellowish-orange chert, 10 mm in diameter, trace of clay, as above.
120.0 - 125.0	Sand, light-olive-gray to light-gray, clear quartz, medium-grained, some coarse-grained, subrounded.
125.0 - 130.0	Sand, light-olive-gray, clear quartz, coarse-grained, subrounded, trace clay, light-gray, sandy, clear quartz, medium-grained.
130.0 - 135.0	Sand, light-olive-gray to yellowish-gray, clear quartz, coarse-grained, trace of very coarse-grained, subangular to subrounded, trace of clay, as above.

clay

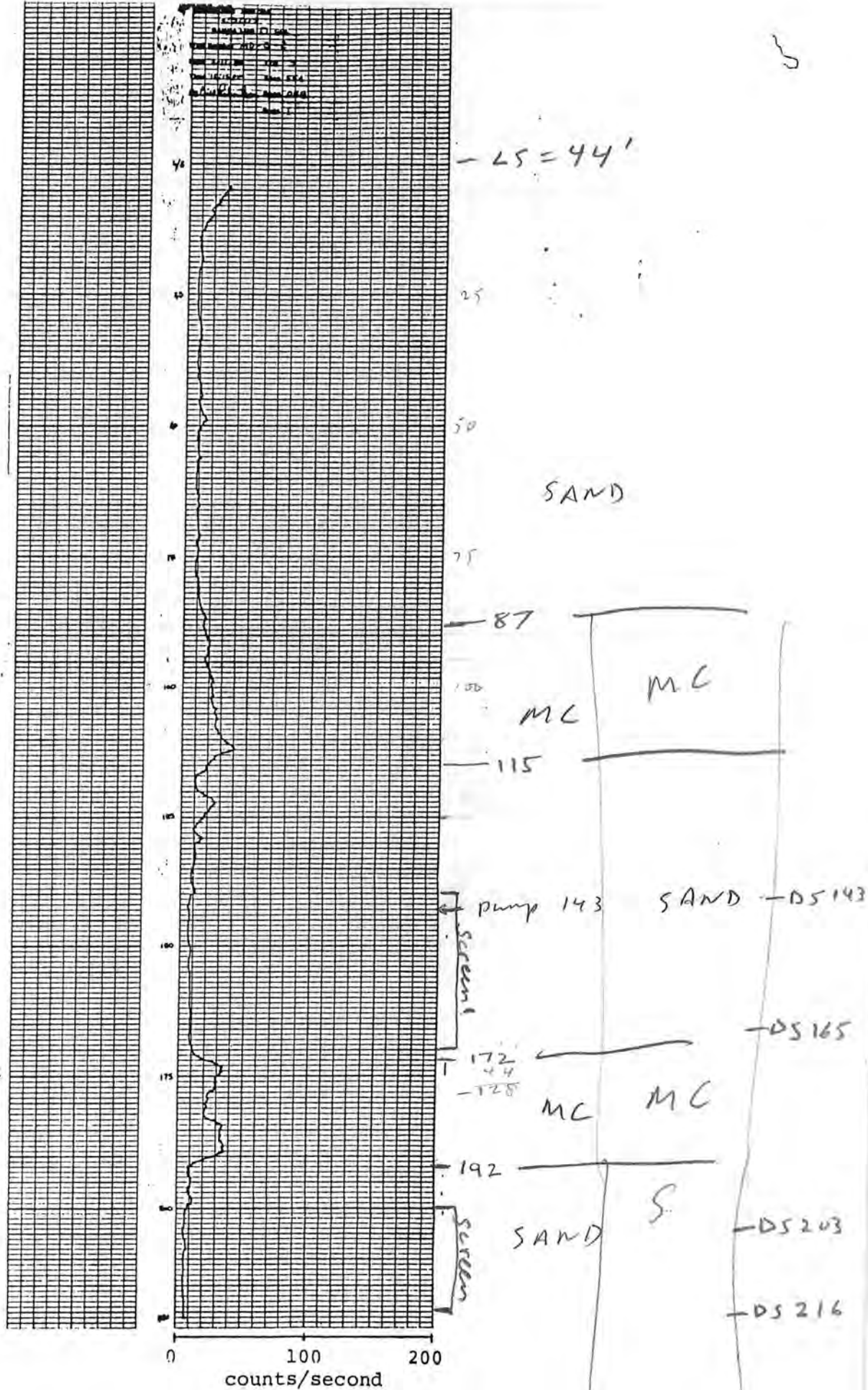
MD-3A (continued)

Depth (in feet)	Description
135.0 - 145.0	Sand, light-olive-gray, clear quartz, coarse- to very coarse-grained, subrounded.
145.0 - 150.0	Sand, light-olive-gray to light-gray, clear quartz, coarse-grained, few medium-grained, subrounded.
150.0 - 160.0	Sand, light-gray, clear quartz, medium-grained, some coarse-grained, subrounded.
160.0 - 165.0	Sand, light-olive-gray to light-gray, clear quartz, medium- to coarse-grained, some very coarse-grained, subrounded.
165.0 - 170.0	Sand, same as above, trace of gravel, white quartz and dark-gray chert, 3 to 6 mm in diameter.
170.0 - 173.0	Sand, light-olive-gray to light-gray, clear quartz, coarse- to very coarse-grained, subrounded.
173.0 - 180.0	Clay, light-gray, sandy, clear quartz, medium-grained, subrounded.
180.0 - 185.0	Clay, greenish-gray, stiff, sandy, clear quartz, fine- to medium-grained, subrounded, some sand, light-olive-gray, clear quartz, coarse- to very coarse-grained.
185.0 - 190.0	Clay, greenish-gray with minor light-brown, stiff, sandy in places, clear quartz, fine- to medium-grained.
190.0 - 195.0	Sand, light-olive-gray, clear quartz, coarse-grained, few very coarse-grained, trace of gravel, clear to white quartz and dark-yellowish-orange chert, 3 to 4 mm in diameter, minor clay, as above.
195.0 - 205.0	Sand and gravel, sand, light-olive-gray, clear quartz, coarse- to very coarse-grained, subangular to subrounded, gravel, clear to white quartz, very pale-orange chert and dark opaque, 2 to 10 mm in diameter.
205.0 - 210.0	Sand and gravel, sand, light-olive-gray, clear quartz, very coarse-grained, subangular to subrounded, gravel, as above, finer, 3 to 7 mm in diameter.
210.0 - 215.0	Sand, same as above, gravel, as above, less abundant.

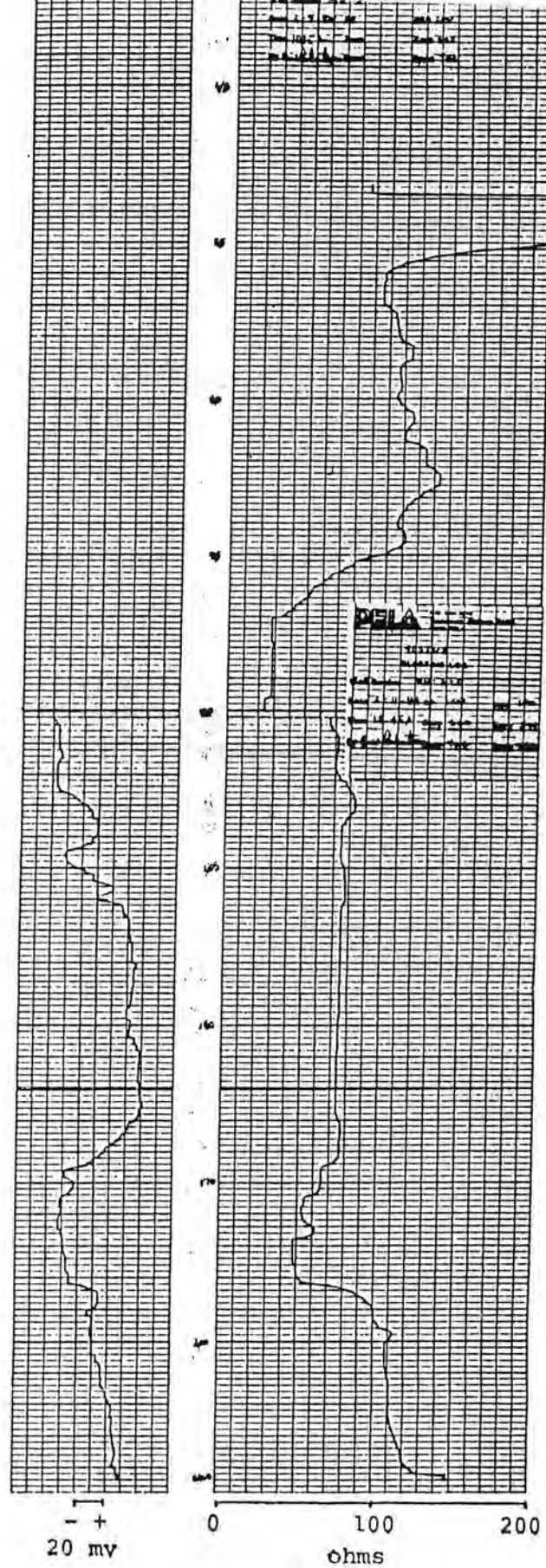
Clay

MD-3A (continued)

Depth (in feet)	Description
215.0 - 221.0	Sand, light-olive-gray, clear quartz, coarse- to very coarse-grained, subangular to subrounded, gravel, as above, less abundant, finer, 2 to 5 mm in diameter.
221.0	TOTAL DEPTH.

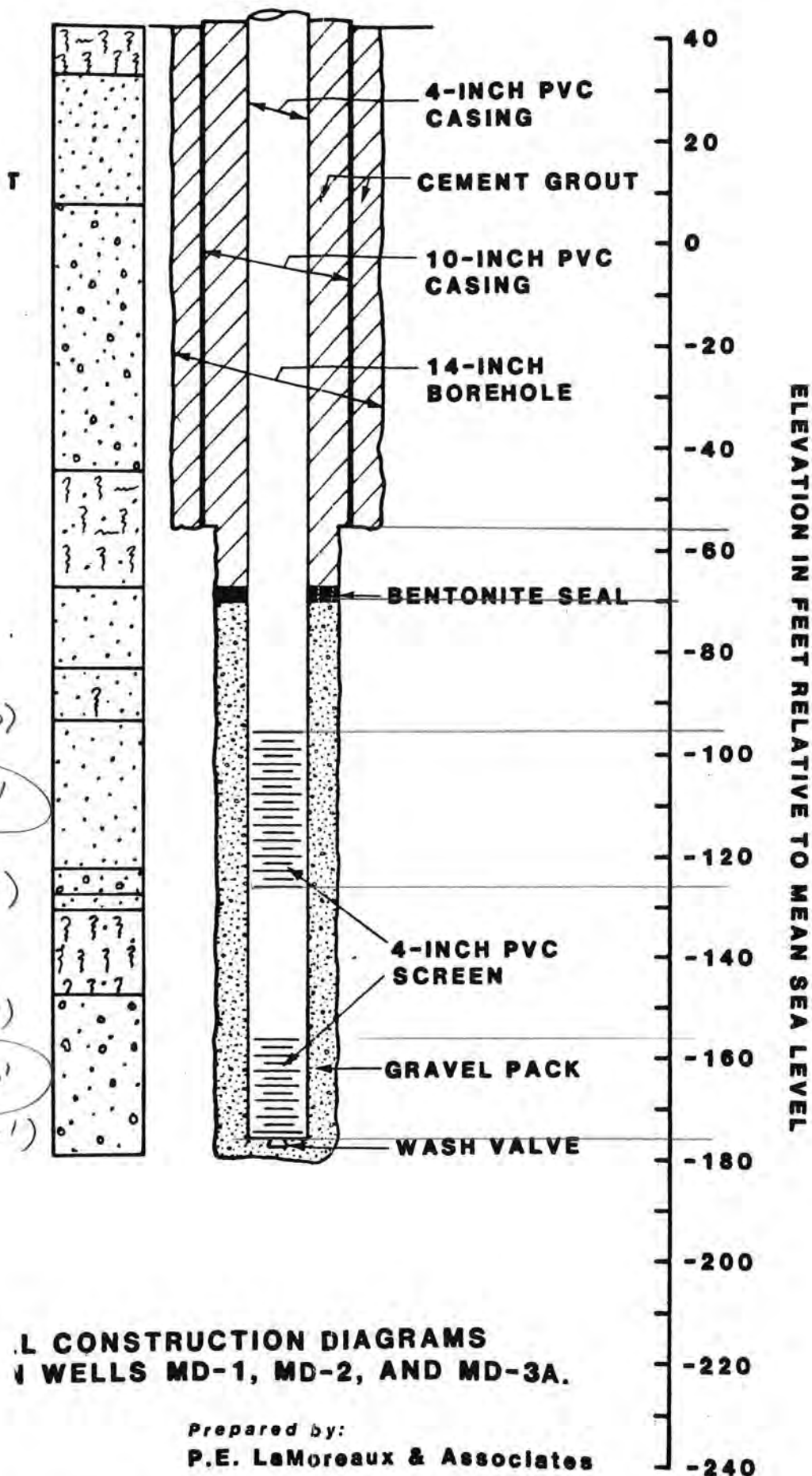


Gamma log for MD-3A: 4-221 feet below land surface



Electric log for MD-3A: 17-221.5 feet below land surface

MD-3A



**CONSTRUCTION DIAGRAMS
WELLS MD-1, MD-2, AND MD-3A.**

Prepared by:
P.E. LaMoreaux & Associates

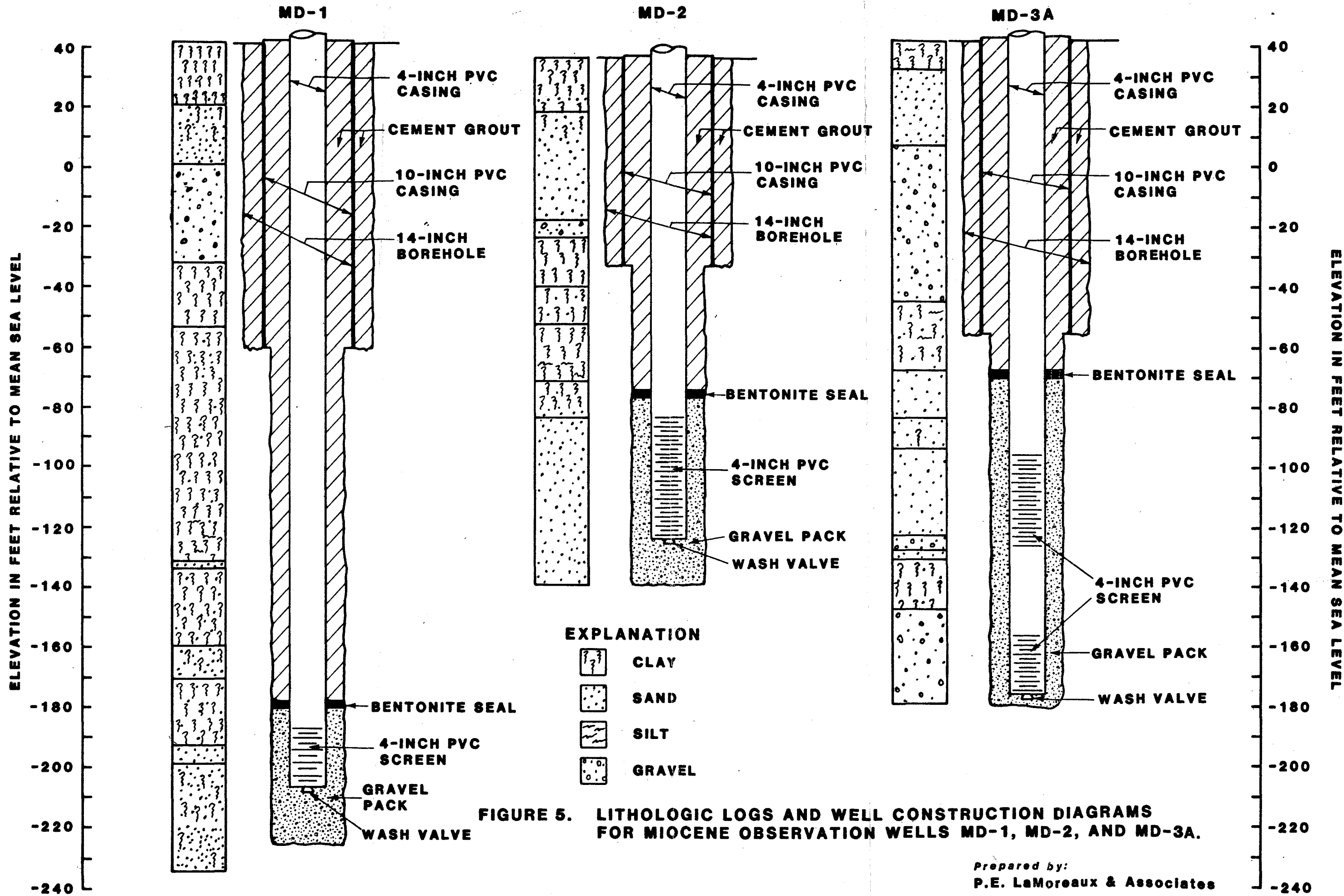
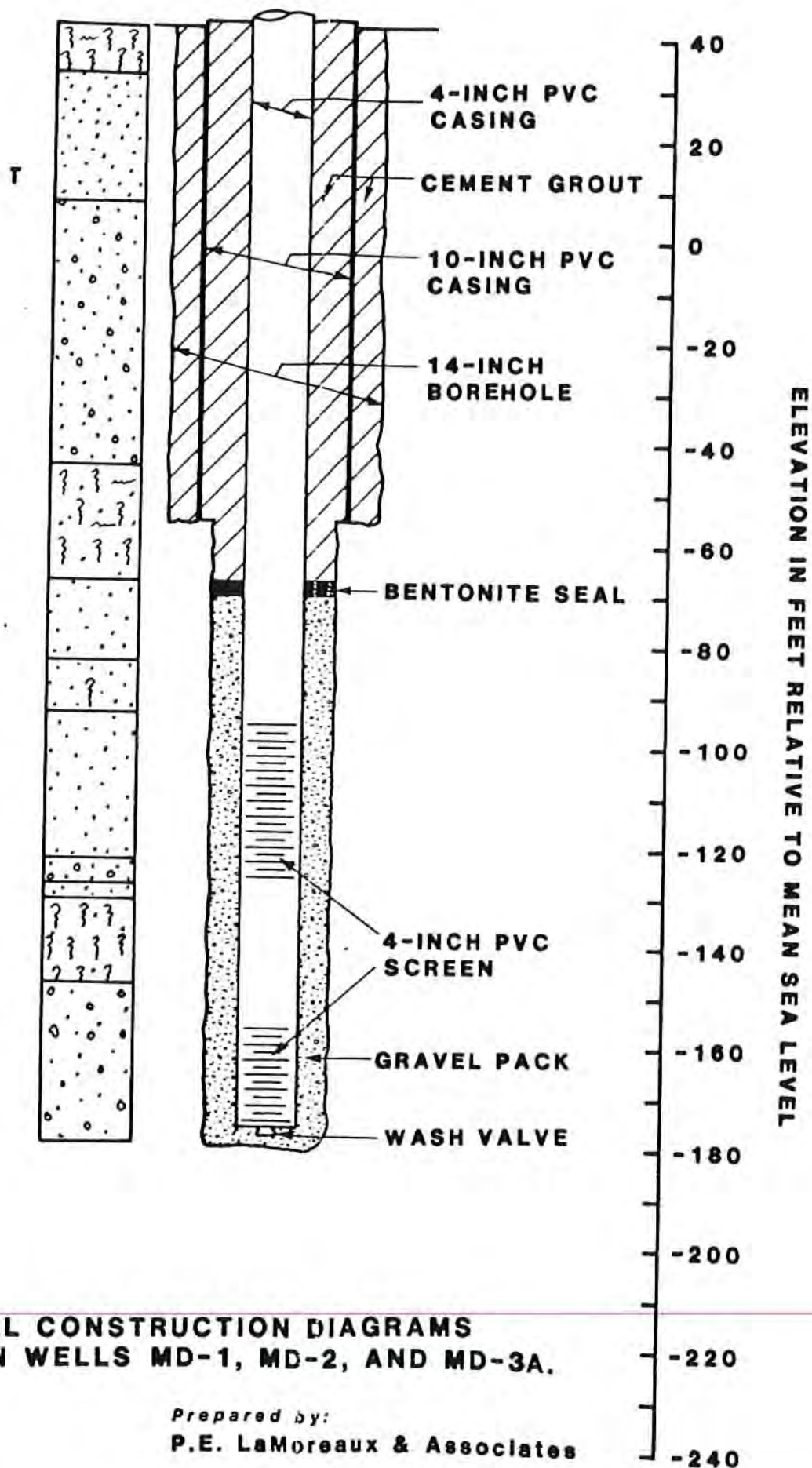


FIGURE 5. LITHOLOGIC LOGS AND WELL CONSTRUCTION DIAGRAMS FOR MIOCENE OBSERVATION WELLS MD-1, MD-2, AND MD-3A.

Prepared by:
P.E. LaMoreaux & Associates



**CONSTRUCTION DIAGRAMS
WELLS MD-1, MD-2, AND MD-3A.**

Prepared by:
P.E. LaMoreaux & Associates

Project: CIBA Miocene Well Installations

Sheet 1 of 4

Project No.: 7740 Logged by: Robert SpencerWell/Boring: MD-3BWell/Boring Location: W088 00 19.1 N 31 16 15.6Date: June 22-27, 2001Drilling Method: Mud rotary

Depth to Groundwater: _____

Elevations - Ground Surface: _____

Driller: Griner DrillingRemarks: TOC Elevation: 44.01 Ft. NGVD

Sands-SW, SP



Gravels, GW, GP



Silt-ML, MH



Sands w/ fines-SM, SC



Clays-CL, CH



Organic soils-PT



Depth, Ft-BGS	Sample Location	Blows	Lithologic Description	Graphical Logs		Comments from Drillers log
				Strata	Well Construction	
10			Drilled to 90 feet without collecting split-spoon samples. Lithology based on gamma log. Hit clay about 85 feet.			6/22/2001 7:00-8:00 Drill 5" hole to 90 feet. 8:00-10:30 Waiting on logger. 10:30-11:00 ERM running gamma and E-logs. Thunderstorms stop work for the day.
20						
30						6/25/2001 8:30-3:30 Reamed hole 12" to 90 feet. Set casing and grouted with 15 bags of grout.
40						
50						

Project: CIBA Miocene Well Installations
Project No.: 7740

Well/Boring: MD-3B
Logged by: Robert Spencer

Depth, Ft-BGS	Sample Location	Blows	Lithologic Description	Graphical Logs		Comments from Drillers log
				Strata	Well Construction	
60						
70						
80						Surface casing set to 90 feet.
90						6/26/2001 7:00 - 9:00 Drilled to 120 feet. No samples collected.
100			Hit coarse gravel at 93 feet. Size: 1/2-3/4" w/ some as large as 1-1/2". Gravel zone from 93' to 102'.			9:30-11:00 ERM logging hole.
110						11:00-12:30 Drilled to 260 feet.
120			SANDY CLAY(?) - 116-123 feet. Lithology based on gamma log.			12:30-1:30 Circulated and pulled out of hole.
130			SANDY CLAY(?) - 126-130 feet. Lithology based on gamma log.			1:30-2:30 ERM logging hole. 2:30-3:30 Reaming hole to 220 feet.

Project: CIBA Miocene Well Installations
Project No.: 7740

Sheet 3 of 4
Well/Boring: MD-3B
Logged by: Robert Spencer

Depth, Ft-BGS	Sample Location	Blows	Lithologic Description	Graphical Logs		Comments from Drillers log
				Strata	Well Construction	
130						6/26/2001 (Continued) 3:30 - 4:00 Circulated hole.
140						4:00-5:00 Pull out and run casing and screen. Install sand pack.
150						Volclay plug Top of sand at approximately 150 ft. BGS
160						Materials: 200' of 4" casing 20' of 4" screen 60 bags sand (50 lbs bags) 1 back wash valve
170			SANDY CLAY(?) - 167-188 feet. Lithology based on gamma log			6/27/01 7:30-2:30 Blowing well 2:30 - 5:00 Pulled airline and grouted well casing. 1 bucket voclay 12 bags grout
180						
190						
200						

Project: CIBA Miocene Well Installations
 Project No.: 7740 _____

Well/Boring: **MD-3B**
 Logged by: Robert Spencer

Depth, Ft-BGS	Sample Location	Blows	Lithologic Description	Graphical Logs		Comments from Drillers log
				Strata	Well Construction	
200						
210						
220						
230						Geologist's Note: "Rathole" or borehole below bottom of well filled with drilling mud left in the hole and a combination of natural formation caving, cuttings from reaming hole to 7.5 " and filter pack material.
240						
250						
254-257			SANDY CLAY (?) - 254-257 feet. Lithology based on gamma log.			
260						
270						

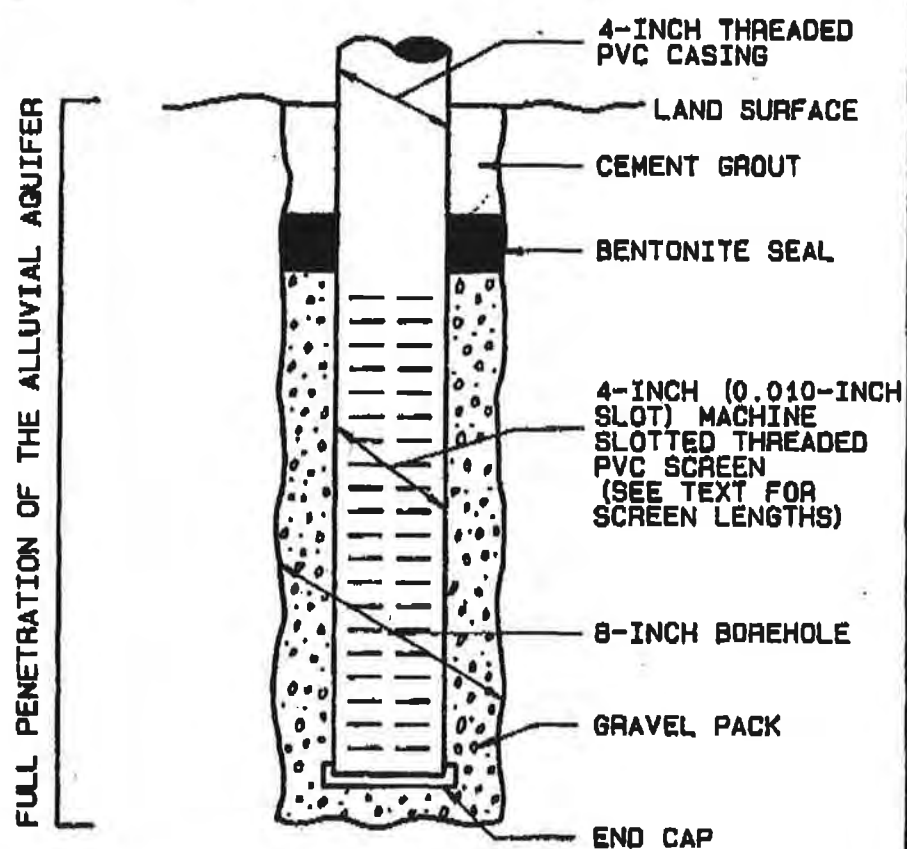


FIGURE 2. GENERALIZED WELL CONSTRUCTION DIAGRAM FOR OBSERVATION WELLS OW-10 AND OW-11

APRIL 17, 1988

Prepared by:
P.E. LANDREAU & ASSOCIATES, INC.



LITHOLOGIC DESCRIPTION
Observation Well OW-10

OWNER: Ciba-Geigy Corporation
DATE DRILLED: April 2, 1986
DATE COMPLETED: April 2, 1986
PELA GEOLOGISTS: A. Patton/S. Godfrey

Depth
(in feet below
land surface)

Description

0 - 2.0	Fill material, sand, coarse-grained; clear quartz gravel up to 0.7 cm in diameter; grayish-orange, 10YR 7/4.
2.0 - 5.0	Clay and sand, dark yellowish-orange, 10YR 6/6 to grayish-orange, 10YR 7/4 mottled with some moderate reddish-brown, 10R 4/6 and light gray, N7.
5.0 - 10.0	Clay, very light gray N8 with some dark yellowish-orange, 10YR 6/6, clean, soft.
10.0 - 15.0	Clay, grayish-orange, 10YR 7/4, clean, soft with abundant moderate reddish-brown, 10R 4/6 silt-rich clay.
15.0 - 20.0	Clay as above, moderate reddish-brown, 10R 4/6 content decreasing.
20.0 - 25.0	Clay and sand; clay is light gray, N7, and rich in moderate reddish-brown silt, 10R 4/6; trace of sand, clear, very fine-grained, subrounded to subangular.
25.0 - 30.0	Clay and sand; clay is light gray, N7, and rich in moderate reddish-brown silt, 10R 4/6; trace of sand, clear, very fine-grained, subrounded to subangular.
30.0 - 35.0	Clay and sand; clay is light gray, N7, and rich in moderate reddish-brown silt, 10R 4/6; trace of sand, clear, very fine-grained, subrounded to subangular.
35.0 - 40.0	Sand, clear, medium-grained, subrounded to rounded, well sorted, clean.
40.0 - 45.0	Sand, clear, medium-grained, subrounded to rounded, well sorted, clean; trace mica.



LITHOLOGIC DESCRIPTION
Observation Well OW-10
(continued)

OWNER: Ciba-Geigy Corporation
DATE DRILLED: April 2, 1986
DATE COMPLETED: April 2, 1986
PELA GEOLOGISTS: A. Patton/S. Godfrey

Depth (in feet below land surface)	Description
45.0 - 50.0	Sand, clear, medium-grained, subrounded to rounded, well sorted, clean; trace mica.
50.0 - 55.0	Sand, clear, medium-grained with trace of coarse-grained, clean, subangular to subrounded, clear quartz sand; trace mica.
55.0 - 60.0	Sand, clear, medium- to coarse-grained, subangular to subrounded quartz, clean; trace mica.
60.0 - 65.0	Sand, clear, varicolored, medium- to coarse-grained, subangular to subrounded quartz; trace 3 mm-diameter gravel.
65.0 - 70.0	Sand as above, slight increase in gravel content.
70.0 - 75.0	Sand with minor gravel, as above.
75.0 - 80.0	Sand, clear, coarse-grained, subangular; abundant 2-3 mm varicolored gravel.
80.0 - 85.0	Sand, clear, coarse-grained; abundant varicolored gravel up to 10 mm diameter.
85.0 - 90.0	Quartz gravel, varicolored, subrounded, up to 20 mm diameter.
90.0 - 95.0	Quartz gravel, varicolored, subrounded, up to 10 mm diameter.
95.0 - 97.0	Clay, light gray, N7, to light olive gray, 5Y 6/1, soft to hard.
97.0	Total depth

PELA

20-10-1964
Wavelength: 4880 Å
Color: 4880

4880

Wavelength: 4880 Å

Wavelength: 4880 Å

Wavelength: 4880 Å

Wavelength: 4880 Å

Wavelength: 4880 Å

Wavelength: 4880 Å

0

25

50

75

94

100
COUNTS/SEC

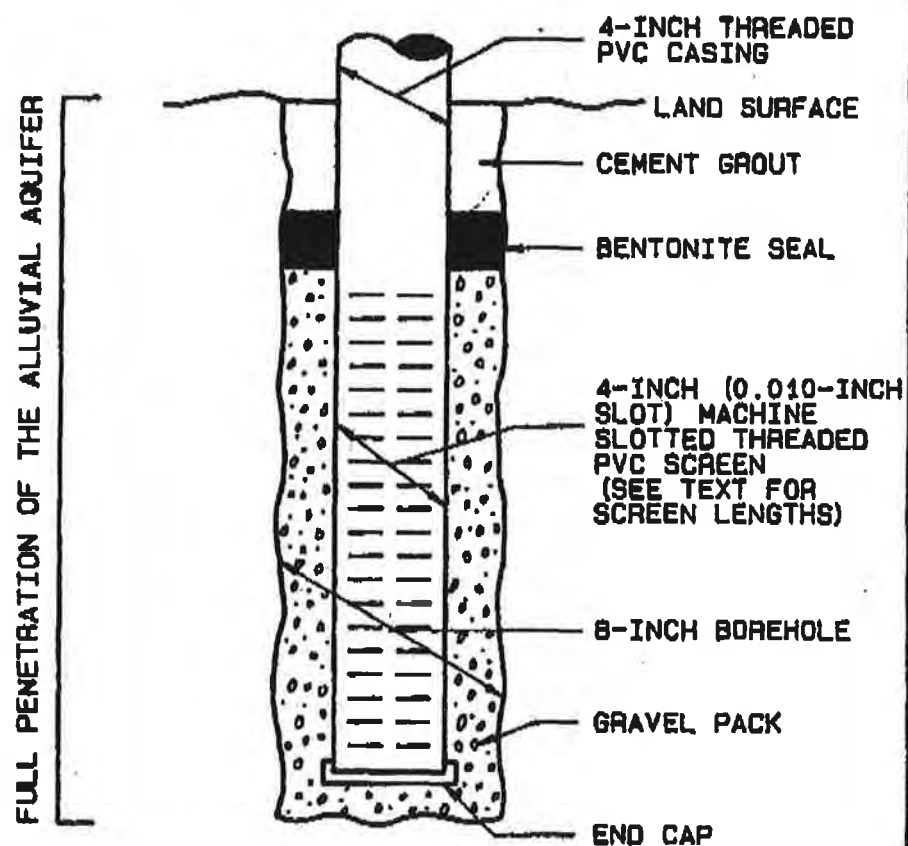


FIGURE 2. GENERALIZED WELL
CONSTRUCTION DIAGRAM FOR
OBSERVATION WELLS OW-10 AND
OW-11

APRIL 17, 1985

Prepared by:
P.E. LAMOREAUX & ASSOCIATES, INC.



LITHOLOGIC DESCRIPTION
Observation Well OW-11

OWNER: Ciba-Geigy Corporation
DATE DRILLED: April 1, 1986
DATE COMPLETED: April 1, 1986
PELA GEOLOGISTS: A. Patton/S. Godfrey

Depth
(in feet below
land surface)

Description

0 - 2.0	Fill material, sand and gravel.
2.0 - 5.0	Silt, very fine-grained, olive-gray to olive-black.
5.0 - 10.0	Clay, moderate yellow-brown, 10YR 5/4, to light gray to moderate reddish-brown, 10R 4/6.
10.0 - 15.0	Clay, yellow-gray, 5Y 7/2, with some moderate reddish-brown, 10R 4/6.
15.0 - 20.0	Clay, yellow-gray, 5Y 7/2, with some moderate reddish-brown, 10R 4/6.
20.0 - 25.0	Clay as above with very fine-grained sand, clear, subangular to subrounded, well sorted.
25.0 - 30.0	Sand, fine to medium-grained clear quartz, subangular to subrounded.
30.0 - 35.0	Sand, fine to medium-grained clear quartz, subangular to subrounded.
35.0 - 40.0	Sand, medium-grained, well-sorted clear quartz, subangular to subrounded.
40.0 - 45.0	Sand, clear quartz, medium- to coarse-grained, subangular to subrounded.
45.0 - 50.0	Sand, clear quartz, medium- to coarse-grained, subangular to subrounded.
50.0 - 55.0	Sand, clear quartz, coarse-grained, subangular to subrounded, well sorted.



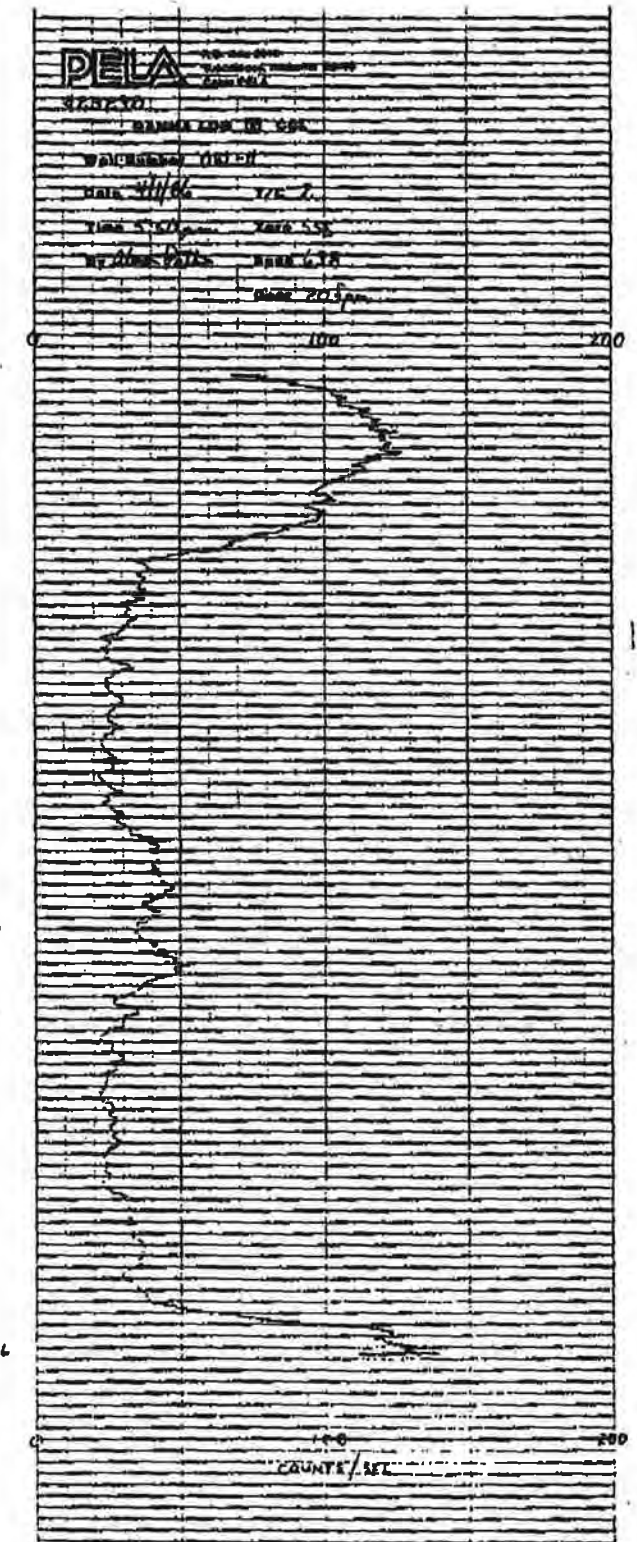
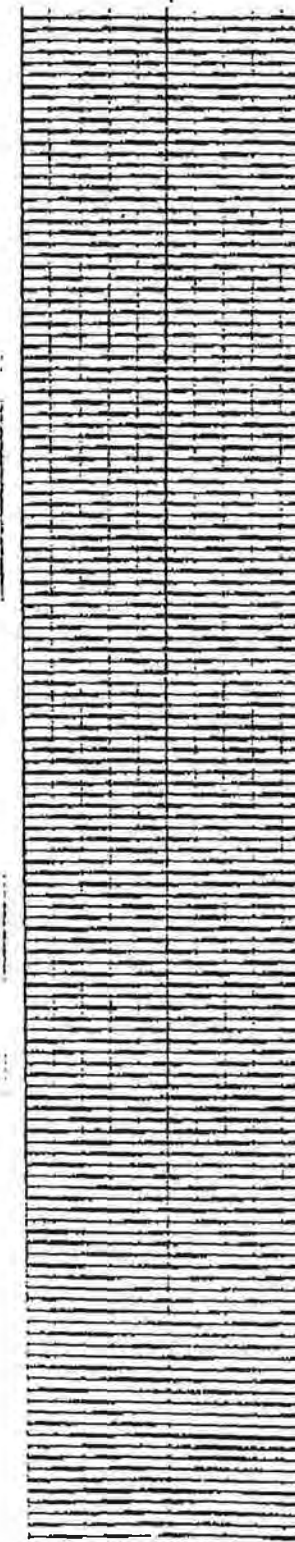
LITHOLOGIC DESCRIPTION
Observation Well OW-11
(continued)

OWNER: Ciba-Geigy Corporation
DATE DRILLED: April 1, 1986
DATE COMPLETED: April 1, 1986
PELA GEOLOGISTS: A. Patton/S. Godfrey

Depth
(in feet below
land surface)

Description

55.0 - 60.0	Sand, clear quartz, coarse- to very coarse-grained, subangular to subrounded; trace 3 mm. quartz gravel.
60.0 - 65.0	Gravel and sand; gravel up to 7 mm. diameter; sand is coarse- to very coarse-grained as above, trace light gray sandy clay.
65.0 - 70.0	Gravel, 3 mm to 10 mm diameter, quartz and chert; sand, coarse-grained; trace of light gray clay.
70.0 - 75.0	Gravel, up to 15 mm diameter; sand as above.
75.0 - 80.0	Gravel, quartz, rounded, up to 15 mm diameter, varicolored.
80.0 - 85.0	Gravel, quartz, rounded, up to 15 mm diameter, varicolored.
85.0 - 90.0	Clay, light gray to light greenish gray with gravel as above.
90.0	Total depth



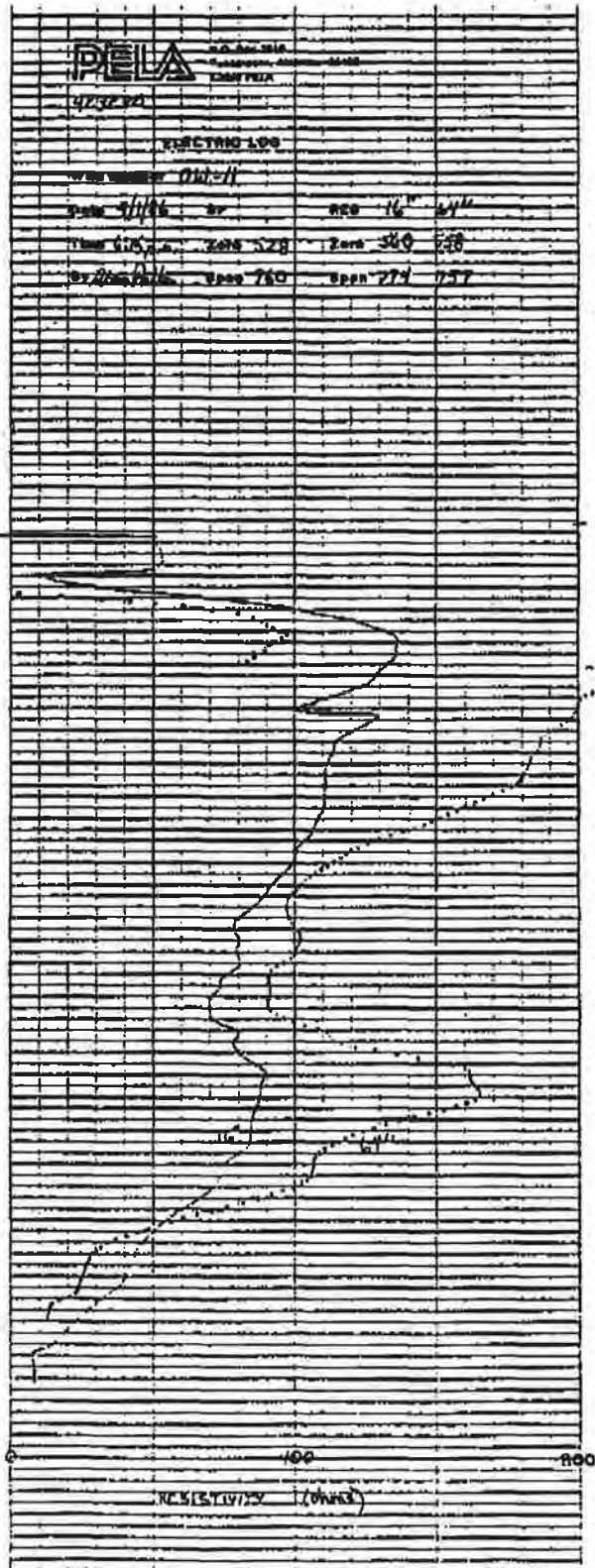


25

50

75

88.2



SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/13/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.75'
LATITUDE: 31.272168
LONGITUDE: -88.002307
DATE COMPLETED: 5/14/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					moist		SP Orange clayey SAND (road fill). (11")
5.0					moist		CL Brown CLAY with silt. (17")
							CL Gray CLAY with reddish orange mottling. (20")
10.0	4.0' / 10'	0.0 / 0.0					No Recovery
15.0					moist		CL Hard gray CLAY. (22")
	9.2' / 10'	0.0 / 0.0					CL Hard gray CLAY with reddish orange mottling. (74")
20.0					dry		CL Hard gray CLAY. (14")
							No Recovery

BORING LOG

PROJECT NAME: BASFMD3B22
BOREHOLE ID: SB23-01 A

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/13/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.75'
LATITUDE: 31.272168
LONGITUDE: -88.002307
DATE COMPLETED: 5/14/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
30					dry		CL Hard gray CLAY with some orange mottling. (48")
25.0	8.0'/10'	0.0 / 0.0					CL Gray silty CLAY. (29")
25							SP Gray fine grained SAND with some silt and clay. (19")
30.0							No Recovery
20					dry		SP Red / tan fine to medium SAND. (52")
35.0	4.3'/10'						No Recovery
15							
40.0							
v. moist							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/13/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.75'
LATITUDE: 31.272168
LONGITUDE: -88.002307
DATE COMPLETED: 5/14/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
10					v. moist to wet		SP Tan to orange fine to medium SAND. (72")
45.0	6.0'/10'						No Recovery
50.0				GW (50'-53')	wet		SW Tan fine to medium SAND with some coarse sand and fine gravel. (76")
55.0	6.3'/10'	0.0 / 0.0					No Recovery
60.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/13/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.75'
LATITUDE: 31.272168
LONGITUDE: -88.002307
DATE COMPLETED: 5/14/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-10				GW (60'-63')	wet		SW Tan fine to medium SAND with some coarse sand and fine gravel. (40")
65.0	10'/10'	0.0 / 0.0					SP Tan fine SAND. (80")
-15							
70.0				GW (70'-73')	wet		SP Tan fine to medium SAND. (24")
-20							SW Tan fine to medium SAND with some coarse sand and fine gravel. (54")
75.0	6.5'/10'	0.0 / 0.0					
-25							No Recovery
80.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/13/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.75'
LATITUDE: 31.272168
LONGITUDE: -88.002307
DATE COMPLETED: 5/14/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
85.0		8.0'/10'	0.0 / 0.0	GW (80'-83')	wet		Brown to tan fine to medium SAND with coarse sand fine gravel. (96")
90.0							No Recovery
95.0		6.7'/10'	0.0 / 0.0	GW (90'-93')	wet		Brown to tan fine to medium SAND with coarse sand fine gravel. (36")
				clay sample collected at 93'	moist		Gray hard CLAY with orange mottling. (44")
100.0							No Recovery

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/13/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.75'
LATITUDE: 31.272168
LONGITUDE: -88.002307
DATE COMPLETED: 5/14/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION

End of Boring @ 100'. Tremie grouted borehole to surface upon completion.

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					dry		SP Dry orange / brown SAND (road fill). (4")
					moist		ML/CL Gray SILT / CLAY, some organic matter and sand. (12")
45					dry		CL Brittle gray CLAY with orange sand and silt. (6")
							CL Hard gray CLAY with some brown sand and silt. (26")
5.0	4.0' / 10'	1.1 / 1.1					No Recovery
40							
10.0					dry		CL Hard gray CLAY with some brown sand and silt. (12")
					moist		CL Gray sandy CLAY. (5")
35							SP Brown to tan fine to medium SAND. (8")
					dry		CL Brown firm CLAY with silt. (13")
15.0	3.2' / 10'	0.0 / 0.0					No Recovery
30							
20.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
25.0		7.7'/10'	0.0 / 0.0		dry		CL Brown to dark brown soft CLAY with silt. (84")
20.0					moist		SP Fine brown to tan SAND. (8")
30.0							No Recovery
35.0		5.2'/10'	0.0 / 0.0		moist		SP Fine brown to tan SAND. (62")
40.0							No Recovery
moist to							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
5					moist to wet		SW Light brown to tan fine to medium SAND, trace coarse sand. Clay nodule observed at 44.5'. (96")
45.0	8.0'/10'	0.0 / 0.0					
0							No Recovery
50.0				GW (50'-53')	wet		SP Brown fine SAND, some silt. (24")
-5							SW Tan to light tan fine to medium SAND, some coarse sand and trace fine gravel. (36")
55.0	5.0'/10'	0.0 / 0.0					No Recovery
-10							
60.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
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LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
15				GW (60'-63')	wet		Tan to light tan fine to medium SAND, some coarse sand and trace fine gravel. (36")
65.0	3.0'/10'	0.0 / 0.0					No Recovery
20							
70.0				GW (70'-73')	wet		Brown fine SAND with silt and clay, trace fine gravel. (36")
25							
75.0	6.4'/10'	0.0 / 0.0					Tan fine to medium SAND with some fine gravel. (41")
30							No Recovery
80.0							

SITE LOCATION:	BASF
ADDRESS:	1379 Ciba Rd., McIntosh, AL.
LOGGED BY:	C. Behnke / D. Williams
DRILLING COMPANY:	Walker Hill
DRILLING METHOD:	Sonic
DATE STARTED:	5/2/23

TOTAL DEPTH:	250'
DEPTH TO WATER:	48'
GROUND SURFACE ELEVATION:	47.04'
LATITUDE:	31.271816
LONGITUDE:	-88.003751
DATE COMPLETED:	5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-35				GW (80'-83')	wet		Tan fine to medium SAND with coarse sand and fine gravel. (84")
85.0	7.0'/10'	0.0 / 0.0					
-40							
90.0				clay sample collected at 90'	moist / dry		Hard gray CLAY. (22")
-45				Attempted GW (90'-93'), no yield			Softer brown SILT / CLAY with some fine sand. (5")
95.0	9.0'/10'	0.0 / 0.0					Hard gray CLAY. (82")
-50							
100.0							No Recovery

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
105.0		9.6'/10'	0.0 / 0.0		moist / dry		Hard gray CLAY. (100")
110.0					moist		Softer gray CLAY with silt. (16")
115.0		10'/10'	0.0 / 0.0		moist / dry		Hard gray CLAY, trace silt. (106")
120.0					moist		Gray SILT with some clay. (6")
					moist / moist /		Hard gray CLAY. (8")

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
125.0		10'/10'	0.0 / 0.0		dry / moist / dry		CL Hard blue / gray CLAY, trace sand and silt throughout. (120")
130.0					dry / moist		CL Hard gray CLAY. (25")
							CL Hard brown CLAY. (13")
135.0		10'/10'	0.0 / 0.0				CL Hard gray CLAY. (66")
140.0					moist		ML/SP Gray SILT and SAND with some clay. (12")
							CL Gray CLAY. (4")

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					dry / moist		
-95							CL Gray CLAY with silt and sand. (42")
145.0	10'/10'	0.0 / 0.0			dry		CL Hard blue / gray CLAY, slightly greenish at 150'. (78")
-100							
150.0					moist		ML Brown and blue marbled SILT with clay and sand. (56")
-105							
155.0	10'/10'	0.0 / 0.0					CL Very hard gray CLAY. (61")
-110							
160.0							SP Gray fine SAND with some silt and clay. (3")

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
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TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
165.0		10'/10'	0.0 / 0.0		moist		Gray smooth CLAY, more hydrated than above. (120")
170.0		10'/10'	0.0 / 0.0		moist		Gray smooth CLAY, similar to above. (72")
175.0		10'/10'	0.0 / 0.0				Gray SILT and very fine SAND. (48")
180.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
185.0		9.1'/10'	0.0 / 0.0		moist		Smooth gray / brown CLAY, 1" sand / silt lense at 181'. (109")
190.0							No Recovery
195.0		10'/10'			moist / dry		Blue / gray CLAY. (24")
					moist		Gray SILT with clay. (48")
					moist / dry		Hard gray CLAY. (42")
200.0					moist		Gray fine SAND. (6")

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					moist		CL Hard gray CLAY, trace fine sand. (18")
-155					moist / wet		ML/SP Very tight gray SILT and very fine to fine SAND. (30")
205.0	9.0' / 10'	0.0 / 0.0			wet		SW Gray fine to medium SAND with coarse sand and fine gravel. (60")
-160							No Recovery
210.0					wet		SP Gray fine to medium SAND. (54")
-165				GW (210'-213')			
215.0	10' / 10'	0.0 / 0.0					SP Gray to dark gray fine to medium SAND with fine gravel. (66")
-170							
220.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					wet		
				GW (220'-223')			Greenish gray fine to medium SAND, some coarse sand and fine gravel. (36")
-175							
							No Recovery
225.0	3.0'/10'	0.0 / 0.0					
-180							
230.0							No Recovery; only gravel in sample pipe.
-185				GW (230'-233')			
235.0	0'/10'						
-190							
240.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. Behnke / D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/2/23

TOTAL DEPTH: 250'
DEPTH TO WATER: 48'
GROUND SURFACE ELEVATION: 47.04'
LATITUDE: 31.271816
LONGITUDE: -88.003751
DATE COMPLETED: 5/10/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					wet		Gray fine to medium SAND. (14")
				GW (240'-243')			OM Organic wood fragments. (11")
							SW Gray to dark gray fine to medium SAND, some coarse sand and fine gravel with wood fragments. (47")
							SW Gray to dark gray fine to medium SAND, trace fine gravel and sandy CLAY. (16")
				GW (247'-250')			
							End of Boring @ 250'. Natural collapse up to 215', then tremie grouted borehole to surface upon completion.

BORING LOG

PROJECT NAME: BASFMD3B22
BOREHOLE ID: SB23-03 A

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/16/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 44.82'
LATITUDE: 31.271427
LONGITUDE: -88.005253
DATE COMPLETED: 5/22/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					dry		ML Brown clayey SILT, grass at surface. (18")
							CL Reddish orange to gray CLAY. (42")
5.0	40	9.0'/10'	0.0 / 0.0				CL Gray CLAY with reddish orange mottling. (48")
							No Recovery
10.0	35				moist		ML Brown clayey SILT. (24")
							SP Brown to tan fine SAND, some silt. (12")
							SP Tan to orange fine SAND. (48")
15.0	30	7.0'/10'	0.0 / 0.0				No Recovery
20.0	25						

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/16/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 44.82'
LATITUDE: 31.271427
LONGITUDE: -88.005253
DATE COMPLETED: 5/22/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
25.0	20	3.0'/10'	0.0 / 0.0		moist		Tan to light orange fine to medium SAND. (36")
							No Recovery
30.0	15				v. moist		Tan fine to medium grained SAND. (36")
							No Recovery
35.0	10	3.0'/10'	0.0 / 0.0				
40.0	5						

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/16/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 44.82'
LATITUDE: 31.271427
LONGITUDE: -88.005253
DATE COMPLETED: 5/22/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
45.0	0	6.6'/10'			wet		SW Tan fine to medium SAND with some coarse sand and gravel. (79")
50.0	-5						No Recovery
55.0	-10	8.8'/10'	0.0 / 0.0	GW (50'-53')	wet		SP Tan fine to medium SAND. (50")
60.0	-15						SW Tan fine to medium SAND with coarse sand and gravel. (55")
							No Recovery

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/16/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 44.82'
LATITUDE: 31.271427
LONGITUDE: -88.005253
DATE COMPLETED: 5/22/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
65.0	-20	6.0/10'	0.0 / 0.0	GW (60'-63')	wet		Tan fine to medium SAND with coarse sand and gravel. (42")
							Tan fine SAND, trace gravel. (30")
70.0	-25						No Recovery
75.0	-30	8.7/10'	0.0 / 0.0	GW (70'-73')	wet		Tan fine to medium SAND with trace coarse SAND and gravel. (56")
							Tan to brown fine to medium SAND with coarse sand and abundant gravel. (48")
80.0	-35						No Recovery

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/16/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 44.82'
LATITUDE: 31.271427
LONGITUDE: -88.005253
DATE COMPLETED: 5/22/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION

85.0 -40 9.5'/10' 90.0 -45								

End of Boring @ 90'. Tremie grouted borehole to surface upon completion.

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/23/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 46.67'
LATITUDE: 37.272197
LONGITUDE: -88.00517
DATE COMPLETED: 5/24/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					moist		ML Soft gray to orange clayey SILT. (24")
4.5							ML Tan to orange clayey SILT. (20")
5.0	4.7/10'	0.0 / 0.0					CL Stiff gray CLAY with orange mottling. (12")
10.0							No Recovery
15.0	10'/10'	0.0 / 0.0			moist		CL Stiff gray CLAY with reddish orange mottling. (96")
20.0					dry		ML Gray SILT with some orange mottled clay. (12")
							SP Tan to orange fine SAND. (12")

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/23/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 46.67'
LATITUDE: 37.272197
LONGITUDE: -88.00517
DATE COMPLETED: 5/24/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
25.0		4.8'/10'	0.0 / 0.0		dry		Tan to orange fine SAND. (58")
20.0							No Recovery
30.0					moist		Tan to orange fine to medium SAND. (24")
35.0		2.0'/10'	0.0 / 0.0				No Recovery
40.0							

BORING LOG

PROJECT NAME: BASFMD3B22
BOREHOLE ID: SB23-04 A

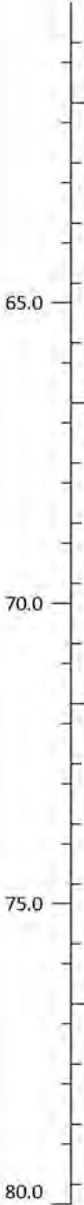
SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/23/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 46.67'
LATITUDE: 37.272197
LONGITUDE: -88.00517
DATE COMPLETED: 5/24/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
5					wet		SP Tan fine to medium SAND. (32")
45.0	10'/10'						SP Orange fine to medium SAND. (40")
0							SP Tan fine to medium SAND. (48")
50.0					wet		SW Tan fine to medium SAND, trace coarse sand and gravel. (42")
-5				GW (50'-53')			
55.0	7.7'/10'	0.0 / 0.0					SW Tan to brown fine to medium SAND with coarse sand and gravel. Trace clay nodules. (18")
-10							SW Tan to orange fine to medium SAND with coarse sand and gravel. (32")
60.0							No Recovery

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/23/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 46.67'
LATITUDE: 37.272197
LONGITUDE: -88.00517
DATE COMPLETED: 5/24/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
	65.0	6.4'/10'	0.0 / 0.0	GW (60'-63')	wet		Tan fine to medium SAND, trace coarse sand and gravel. (30")
							Tan fine to medium SAND with coarse sand and gravel. (47")
							No Recovery
				GW (70'-73')	wet		Tan fine to medium SAND with coarse sand. (72")
							Tan to orange fine to medium SAND with small clay nodules. (36")
80.0		9.5'/10'	0.0 / 0.0				Tan to orange fine to medium SAND with small clay nodules and gravel (6").
							No Recovery

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/23/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 46.67'
LATITUDE: 37.272197
LONGITUDE: -88.00517
DATE COMPLETED: 5/24/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
35.0				GW (80'-83')	wet		Tan to brown fine to medium SAND with abundant coarse sand and gravel. (80")
85.0	6.7/10'	0.0 / 0.0					No Recovery
90.0				clay sample collected at 90'	moist		Blue / gray stiff CLAY. (120")
95.0	10'/10'	0.0 / 0.0		Attempted GW sample 90'-93', no yield.			
100.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 5/23/23

TOTAL DEPTH: 100'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 46.67'
LATITUDE: 37.272197
LONGITUDE: -88.00517
DATE COMPLETED: 5/24/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION

End of Boring @ 100'. Tremie grouted borehole to surface upon completion.

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/6/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 49.02'
LATITUDE: 31.272551
LONGITUDE: -88.003725
DATE COMPLETED: 6/7/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					moist		SC Brown to gray silty CLAY with some orange clayey sand. (12")
							ML Gray clayey SILT with large wood fragments. (28")
45					dry		CL Stiff gray to orange CLAY with red mottling. (32")
5.0	6.0' / 10'	0.0 / 0.0					No Recovery
10.0							CL Stiff gray to orange CLAY with red mottling. (48")
15.0	10' / 10'	0.0 / 0.0					CL Stiff gray to orange / red CLAY. (36")
							ML Orange to gray clayey SILT. (12")
30							SC Tan to gray clayey SAND. (12")
20.0							SP Tan fine SAND. (12")

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/6/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 49.02'
LATITUDE: 31.272551
LONGITUDE: -88.003725
DATE COMPLETED: 6/7/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
25.0		5.0'/10'	0.0 / 0.0				Tan to orange fine to medium SAND with some clay nodules. (60")
30.0					moist		No Recovery
35.0		4.0'/10'	0.0 / 0.0		v. moist		Tan to orange fine to medium SAND with some clay nodules. (24")
40.0							Tan fine to medium SAND. (24")
							No Recovery

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/6/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 49.02'
LATITUDE: 31.272551
LONGITUDE: -88.003725
DATE COMPLETED: 6/7/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
45.0					wet		Tan to orange fine to medium SAND. (30")
50.0	2.5'/10'						No Recovery
55.0				GW (50'-53')	wet		Tan to orange fine to medium SAND. (36")
	8.0'/10'	0.0 / 0.0					Tan fine to medium SAND with some minor clay content. (36")
							Tan fine to medium SAND with coarse sand and gravel. (24")
60.0							No Recovery

TOTAL DEPTH:	90'
DEPTH TO WATER:	~40'
GROUND SURFACE ELEVATION:	49.02'
LATITUDE:	31.272551
LONGITUDE:	-88.003725
DATE COMPLETED:	6/7/23

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/6/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~40'
GROUND SURFACE ELEVATION: 49.02'
LATITUDE: 31.272551
LONGITUDE: -88.003725
DATE COMPLETED: 6/7/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION

85.0	10'/10'			GW (80'-83')			SW	Tan to orange fine to medium SAND with coarse sand and gravel. (44")
				clay sample collected at 84'	wet		CL	Stiff gray CLAY with orange mottling. (76")
90.0					moist			

End of Boring @ 90'. Tremie grouted borehole to surface upon completion.

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/8/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.67'
LATITUDE: 31.272872
LONGITUDE: -88.002637
DATE COMPLETED: 6/8/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					moist		Gray silty CLAY with orange mottling. Grass at surface. (36")
5.0							Gray CLAY with orange mottling, some silt present. (24")
4.5							Stiff gray CLAY with orange mottling. (35")
10.0							No Recovery
4.0					moist		Stiff gray CLAY with red / orange mottling. (48")
15.0							No Recovery
3.5							
20.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/8/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.67'
LATITUDE: 31.272872
LONGITUDE: -88.002637
DATE COMPLETED: 6/8/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
30					moist		CL Stiff gray CLAY with red / orange mottling. (34")
25.0	7.3' / 10'	0.0 / 0.0					ML Gray to orange clayey SILT with some sand. (38")
25							SM Gray silty fine SAND. (16")
							No Recovery
30.0					moist		SP Tan to orange fine to medium SAND. (44")
20							
35.0	3.7' / 10'	0.0 / 0.0					No Recovery
15							
40.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/8/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.67'
LATITUDE: 31.272872
LONGITUDE: -88.002637
DATE COMPLETED: 6/8/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
10					moist		
45.0		7.6'/10'	0.0 / 2.2				
5					wet		
50.0							No Recovery
0			0.0 / 3.9	GW (50'-53')	wet		SP Orange fine to medium SAND with some clay nodules. (30")
55.0		6.5'/10'	0.0 / 8.2				SW Tan fine to medium SAND with some coarse sand, trace gravel. (48")
-5							No Recovery
60.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/8/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.67'
LATITUDE: 31.272872
LONGITUDE: -88.002637
DATE COMPLETED: 6/8/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
10.0				GW (60'-63')	wet		Tan fine to medium SAND with some coarse sand and gravel. (102")
65.0	8.5'/10'	0.0 / 0.0					
15.0							
70.0							No Recovery
20.0				GW (70'-73')	wet		Tan fine to medium SAND with some coarse sand and gravel. (36")
75.0	9.4'/10'						Tan fine to medium SAND with coarse sand and abundant gravel. (29")
25.0							Tan fine to medium SAND with some coarse sand and gravel. Minor clay nodules present. (26")
80.0							Tan fine to medium SAND. (22")
							No Recovery

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 6/8/23

TOTAL DEPTH: 90'
DEPTH TO WATER: ~46'
GROUND SURFACE ELEVATION: 51.67'
LATITUDE: 31.272872
LONGITUDE: -88.002637
DATE COMPLETED: 6/8/23

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION

					wet					
				GW (80'-83')						
			0.0 / 3.4							
85.0			8.2' / 10'							
				clay sample collected at 86'	moist					
-35			0.0 / 3.0							
90.0										

End of Boring @ 90'. Tremie grouted borehole to surface upon completion. PID calibrated to Chlorobenzene.

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/23/24

TOTAL DEPTH: 78'
DEPTH TO WATER: ~39.5'
GROUND SURFACE ELEVATION: 46.18'
LATITUDE: 31.275007°
LONGITUDE: -88.000386°
DATE COMPLETED: 2/28/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Dry		
45		2.9"/5'	0				Silty Sand SILTY SAND, brown; (0.4')
							Silty Clay SILTY CLAY, shell fragments, reddish brown; (1.0')
							Silty Sand SILTY SAND with rock, white; (1.5')
5.0							No Recovery; (2.1')
40		3'/3'	0		Moist		Silty Clay SILTY CLAY with rock, reddish brown; (2.0')
							Clay CLAY, gray with orange mottling; (1.0')
10.0					Moist		Clay CLAY with some minor SILT, gray with reddish orange mottling; (5.0')
35		5'/10'	0				No Recovery; (5.0')
15.0							
30							
20.0					Moist		Silty Sand SILTY SAND with some CLAY content, reddish orange; (2.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/23/24

TOTAL DEPTH: 78'
DEPTH TO WATER: ~39.5'
GROUND SURFACE ELEVATION: 46.18'
LATITUDE: 31.275007°
LONGITUDE: -88.000386°
DATE COMPLETED: 2/28/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
25		6.5'/10'	0				Silty Sand SILTY SAND, tan to orange; (3.0')
25.0							Sand SAND, fine grained, tan to orange; (1.5')
20							No Recovery; (3.5')
30.0					Very Moist		Sand SAND, fine grained, tan to orange; (2.0')
15		2'/10'	0				No Recovery; (8.0')
35.0							
10					Moist		Sand SAND, fine to medium grained, tan to orange; (8.0')
40.0					Wet		

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/23/24

TOTAL DEPTH: 78'
DEPTH TO WATER: ~39.5'
GROUND SURFACE ELEVATION: 46.18'
LATITUDE: 31.275007°
LONGITUDE: -88.000386°
DATE COMPLETED: 2/28/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
5							
45.0		8'/10'	0	SOIL (44-46')			
0				GW (46-48')			No Recovery; (2.0')
50.0					Wet		Sand SAND with some GRAVEL, fine to coarse grained, tan to orange; (3.5')
-5							Silty Clay SILTY CLAY with some GRAVEL, gray; (0.7')
		9'/10'	0				Sand SAND with GRAVEL, fine to coarse grained, tan to orange; (0.9')
							Silty Clay SILTY CLAY, gray; (1.7')
55.0				SOIL (55-57') & GW (56-58')			Sand SAND with GRAVEL, fine to medium grained, tan; (2.2')
-10							No Recovery; (1.0')
60.0					Wet		Sand SAND with GRAVEL, fine to coarse grained, tan; (1.8')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 2/23/24

TOTAL DEPTH: 78'
DEPTH TO WATER: ~39.5'
GROUND SURFACE ELEVATION: 46.18'
LATITUDE: 31.275007°
LONGITUDE: -88.000386°
DATE COMPLETED: 2/28/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-15							Sand
							SAND, fine to medium grained, tan; (2.0')
							Sand
							SAND with some GRAVEL, fine to medium grained, orange; (3.2')
65.0		7'/10'	0	SOIL (63-65')			No Recovery; (3.0')
-20							
				GW (66-68')			
					Wet		Sand
							SAND, fine to medium grained, brown; (1.0')
70.0				GW (69-71')			Sand
							SAND with GRAVEL, fine to coarse grained, gray; (2.3')
-25					Moist		Clay
		8'/10'	0				CLAY, bluish-gray, Miocene clay; (4.7')
75.0							
-30							No Recovery; (2.0')

BORING LOG

PROJECT NAME: BASFOU124S
BOREHOLE ID: SB24-02A

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/5/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~28'
GROUND SURFACE ELEVATION: 45.13'
LATITUDE: 31.27499°
LONGITUDE: -88.00168°
DATE COMPLETED: 3/6/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0	45				Moist		Silty Clay Grass then SILTY CLAY, shell fragments, brown; (4.2')
		6.9'/8'	0				
5.0	40						Silty Clay SILTY CLAY with some fine SAND, reddish brown to orange; (2.7')
							No Recovery; (1.1')
					Moist		Silty Clay SILTY CLAY with some fine SAND, reddish brown to orange; (2.5')
10.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/5/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~28'
GROUND SURFACE ELEVATION: 45.13'
LATITUDE: 31.27499°
LONGITUDE: -88.00168°
DATE COMPLETED: 3/6/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
35							
		9.2'/10'	0				Clayey/ Silty Sand CLAYEY/SILTY SAND, gray with orange mottling; (2.5')
							Silty Sand SILTY SAND, fine grained, gray; (1.6')
15.0							Sand SAND, fine grained, tan; (1.4')
30							Sand SAND, fine to medium grained, orange, no odor; (1.2')
							No Recovery; (0.8')
					Moist		Sand SAND, fine to medium grained, tan to orange, no odor; (4.4')
20.0							

TOTAL DEPTH:	88'
DEPTH TO WATER:	~28'
GROUND SURFACE ELEVATION:	45.13'
LATITUDE:	31.27499°
LONGITUDE:	-88.00168°
DATE COMPLETED:	3/6/24

LITHOLOGIC DESCRIPTION

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/5/24

TOTAL DEPTH:	88'
DEPTH TO WATER:	~28'
GROUND SURFACE ELEVATION:	45.13'
LATITUDE:	31.27499°
LONGITUDE:	-88.00168°
DATE COMPLETED:	3/6/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
15							
		7.5'/10'	4.0	SOIL (33-35') & GW (33-35')			Sand Same as above, with silt and clay; (2.5')
35.0							No Recovery; (2.5')
10				SOIL (38-40')	Wet		Sand SAND, fine to medium grained, silty, and some clay, tan to orange; (2.5')
40.0							

TOTAL DEPTH:	88'
DEPTH TO WATER:	~28'
GROUND SURFACE ELEVATION:	45.13'
LATITUDE:	31.27499°
LONGITUDE:	-88.00168°
DATE COMPLETED:	3/6/24

LITHOLOGIC DESCRIPTION

TOTAL DEPTH:	88'
DEPTH TO WATER:	~28'
GROUND SURFACE ELEVATION:	45.13'
LATITUDE:	31.27499°
LONGITUDE:	-88.00168°
DATE COMPLETED:	3/6/24

LITHOLOGIC DESCRIPTION

TOTAL DEPTH:	88'
DEPTH TO WATER:	~28'
GROUND SURFACE ELEVATION:	45.13'
LATITUDE:	31.27499°
LONGITUDE:	-88.00168°
DATE COMPLETED:	3/6/24

LITHOLOGIC DESCRIPTION

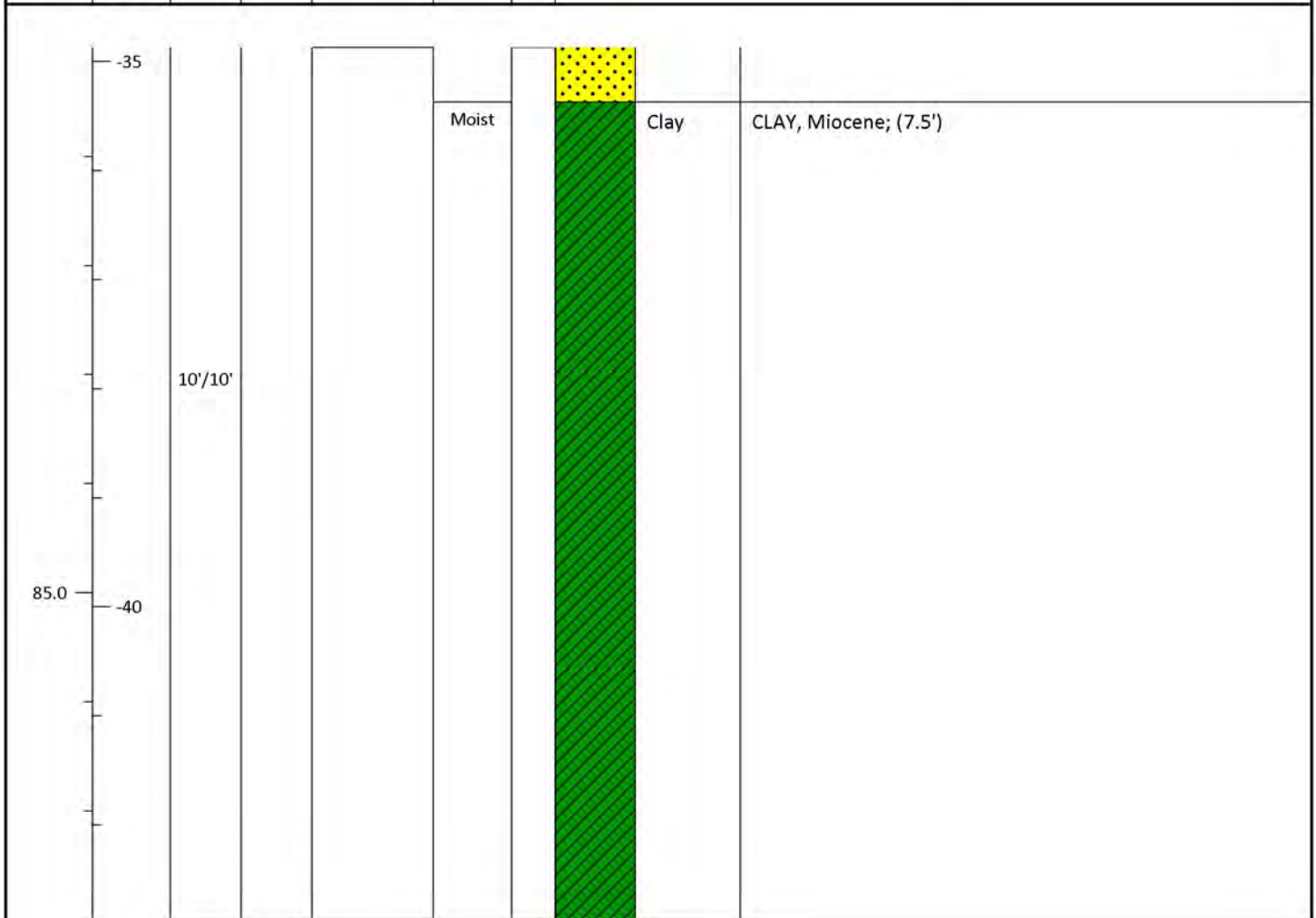
TOTAL DEPTH:	88'
DEPTH TO WATER:	~28'
GROUND SURFACE ELEVATION:	45.13'
LATITUDE:	31.27499°
LONGITUDE:	-88.00168°
DATE COMPLETED:	3/6/24

LITHOLOGIC DESCRIPTION

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/5/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~28'
GROUND SURFACE ELEVATION: 45.13'
LATITUDE: 31.27499°
LONGITUDE: -88.00168°
DATE COMPLETED: 3/6/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION



SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/7/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~36'
GROUND SURFACE ELEVATION: 49.83'
LATITUDE: 31.274979°
LONGITUDE: -88.002640°
DATE COMPLETED: 3/10/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Moist		
			1.8				Silty Clay
							SILTY CLAY, reddish brown; (2.5')
		5'/8'	0.4				Silty Clay
							SILTY CLAY, gray with orange mottling; (2.5')
5.0	45						No Recovery; (3.0')
					Moist		
			0				Clay
							CLAY, gray with orange mottling; (4.5')
10.0	40						
		6'/10'	0				Silty Clay
							SILTY CLAY, gray with reddish orange mottling; (1.5')
							No Recovery; (4.0')
15.0	35						
					Moist		
							Clay
							CLAY, gray with some orange mottling; (4.0')
20.0	30						

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/7/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~36'
GROUND SURFACE ELEVATION: 49.83'
LATITUDE: 31.274979°
LONGITUDE: -88.002640°
DATE COMPLETED: 3/10/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
25.0	25	10'/10'	0				
			0				SANDY CLAY, fine grained, gray to reddish brown; (3.0')
			0				SAND, fine grained, tan to orange; (3.0')
30.0	20	8'/10'	63.3		Moist		SAND, fine to medium grained, tan to orange, strong chlorobenzene (35-36'); (8.0')
35.0	15			Sample attempted 36-38' no yield			No Recovery; (2.0')
40.0	10				Wet		SAND and some SILT, fine to medium grained, tan; (6.0')

BORING LOG

PROJECT NAME: BASFOU124S
BOREHOLE ID: SB24-03A

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/7/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~36'
GROUND SURFACE ELEVATION: 49.83'
LATITUDE: 31.274979°
LONGITUDE: -88.002640°
DATE COMPLETED: 3/10/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
45.0	5	10'/10'	0.2				Sandy/Silty Clay
							SANDY/SILTY CLAY lense; (0.7')
			0.1	SOIL (46-48') & GW (46-48')			Sand
							SAND, fine to medium grained, tan to orange; (3.3)
			0.3		Wet		Sand
							CLAYEY Sand
			0.9				Sand
							SAND, medium grained, with some fine grained sand and little coarse grained sand and gravel, well sorted, tan to orange; (1.0')
							CLAYEY SAND, gray; (0.4')
							Sand
							SAND with some GRAVEL, fine to coarse grained, tan to orange; (2.9')
							CLAYEY Sand
							CLAYEY SAND, gray; (0.7')
							Sand
							SAND with trace GRAVEL, fine to medium grained, tan, gravel increasing around 56'; (3.3')
			0.7	SOIL (54-56') & GW (54-56')			No Recovery; (1.7')
					Wet		Sand
			0				SAND with some GRAVEL, fine to medium grained, orange; (2.6')
60.0	-10						

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/7/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~36'
GROUND SURFACE ELEVATION: 49.83'
LATITUDE: 31.274979°
LONGITUDE: -88.002640°
DATE COMPLETED: 3/10/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
65.0	-15	10'/10'	0	SOIL (66-68') & GW (66-68')			SAND with GRAVEL, fine to medium grained, tan to orange, more gravel than above; (7.4')
70.0	-20	9'/10'	1.7	SOIL (75-77') & GW (76-78')	Wet		SAND and GRAVEL, fine to coarse grained, tan; (9.0')
75.0	-25						No Recovery; (1.0')
80.0	-30		6		Wet		SAND, fine to medium grained, tan; (3.5')

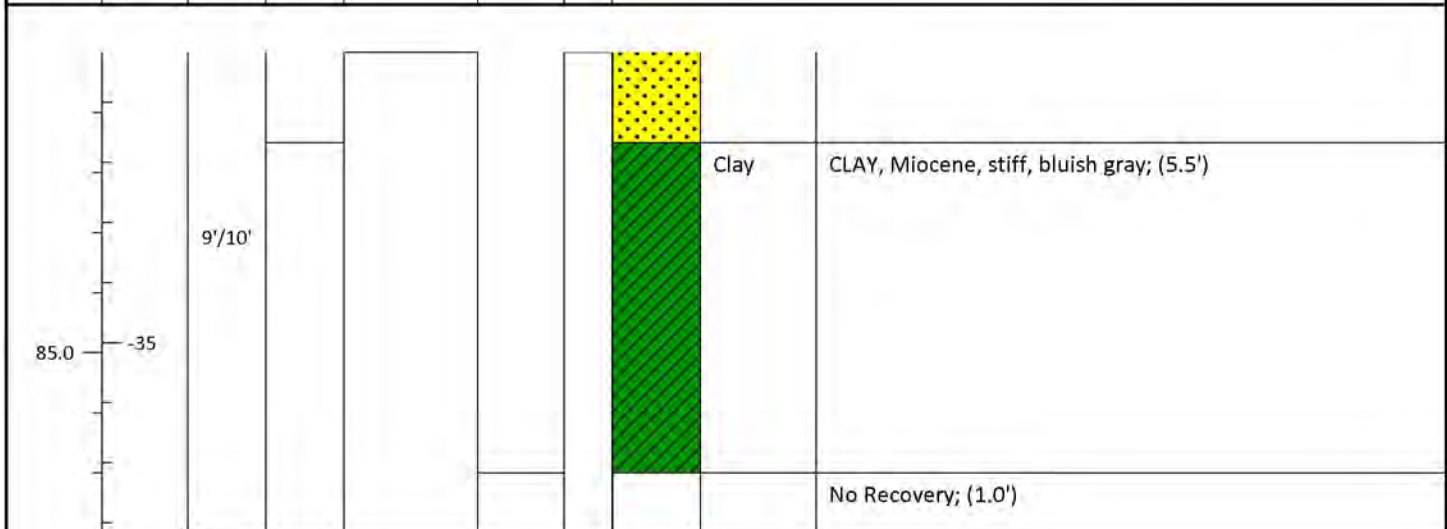
BORING LOG

PROJECT NAME: BASFOU124S
BOREHOLE ID: SB24-03A

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/7/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~36'
GROUND SURFACE ELEVATION: 49.83'
LATITUDE: 31.274979°
LONGITUDE: -88.002640°
DATE COMPLETED: 3/10/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION



SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Moist		
50							
			0				Silty Clay SILTY CLAY with organics and grass, shell fragments, brown; (1.4')
							Silty Sand SILTY SAND, fill material, red; (0.6')
							Silty Clay SILTY CLAY, gray; (1.8')
							Silty Sand SILTY SAND, shell fragments, tan; (0.5')
							Silty Clay SILTY CLAY, gray with orange mottling; (3.2')
5.0							
45							
							No Recovery; (1.5')
					Moist		
							Silty Clay SILTY CLAY, reddish brown; (1.7')
10.0			0				
40							Silty Clay SILTY CLAY, gray with orange mottling; (4.8')
15.0							No Recovery; (3.5')
35							
					Moist		
							Silty Clay SILTY CLAY, reddish brown; (3.7')
20.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
30			0				
25.0	8.5'/10'						Silty Sand
25							SAND, fine grained, tan to orange; (3.5')
							No Recovery; (1.5')
30.0			0		Moist		SAND, fine grained, tan; (3.5')
20							
	4.5'/10'				Wet		SAND, fine to medium grained, tan to orange; (1.0')
35.0							No Recovery; (5.5')
15							
40.0			1.0		Wet		SAND, fine to medium, tan; (3.5')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
10							
		6'/10'	6.6	SOIL (42-44') & GW (42-44')			Sand
45.0							No Recovery; (4.0')
5							
50.0					Wet		Sand
0							SAND with GRAVEL, fine to coarse grained, tan to orange; (3.7')
		9'/10'					Clayey Sand
							CLAYEY SAND, gray to orange; (0.8')
							Sand
							SAND, fine to medium grained, orange; (1.5')
55.0							Sand
-5				SOIL (56-58') & GW (56-58')			SAND, fine to medium grained, with little gravel and coarse grained sand, tan; (3.0')
							No Recovery; (1.0')
60.0					Wet		Sand
							SAND with GRAVEL, fine to coarse grained, tan to orange; (6.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-10			0.3				
		9'/10'					
65.0			0.5				Sand
-15				SOIL (66-68') & GW (66-68')			SAND with little small GRAVEL and coarse grained sand, fine to medium grained, tan; (3.0')
							No Recovery; (1.0')
70.0			0.7		Wet		Sand and Gravel
-20		8'/10'					SAND and GRAVEL, fine to coarse grained, tan to orange, gravel increasing from 74-76'; (8.0')
75.0				SOIL (74-76') & GW (74-76')			
-25							No Recovery; (2.0')
80.0			0.4		Wet		Sand
							SAND with GRAVEL, fine to coarse, tan; (2.5')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/11/24

TOTAL DEPTH: 88'
DEPTH TO WATER: ~31.5'
GROUND SURFACE ELEVATION: 50.86'
LATITUDE: 31.274106°
LONGITUDE: -88.003331°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-30							
		8.2'/10'	55.3	SOIL (83-85') & GW (83-85')			Sand SAND with GRAVEL, fine to coarse, tan to orange; (4.9')
85.0							
-35							Clay CLAY, Miocene; (0.8')
							No Recovery ; (1.8')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. OBrien
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/2/24

TOTAL DEPTH: 240'
DEPTH TO WATER: ~38'
GROUND SURFACE ELEVATION: 44.98'
LATITUDE: 31.270591°
LONGITUDE: -88.004052°
DATE COMPLETED: 4/9/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Moist		Topsoil
							Topsoil; (0.3')
							Clayey Silt
							CLAYEY SILT, light brown; (0.2')
							Silty Clay
							SILTY CLAY, light brown; (2.0')
							Clay
							CLAY, gray with tan/orange mottling; (4.2')
5.0	40	8'8"	0				Silty Sand
							SILTY SAND, well graded, dark orange; (1.3')
					Moist		Sand
							SAND, well graded, dark orange; (1.0')
							Silty Sand
							SILTY SAND, well graded, dark orange with tan mottling; (0.8')
10.0	35						Sand
							SAND, well graded, dark orange; (0.2')

SITE LOCATION:	BASF
ADDRESS:	1379 Ciba Rd., McIntosh, AL
LOGGED BY:	C. OBrien
DRILLING COMPANY:	Walker Hill
DRILLING METHOD:	Sonic
DATE STARTED:	4/2/24

TOTAL DEPTH:	240'
DEPTH TO WATER:	~38'
GROUND SURFACE ELEVATION:	44.98'
LATITUDE:	31.270591°
LONGITUDE:	-88.004052°
DATE COMPLETED:	4/9/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
			0				
		4.2'/10'					Sand SAND, well graded, brown; (0.4')
							Sand SAND, well graded, brown with orange mottling; (1.8')
15.0 — 30							No Recovery; (5.8')
					Moist		Sand SAND, well graded, brown; (1.3')
20.0 — 25			0				Sand SAND, well graded, tan; (1.2')

BORING LOG

PROJECT NAME: BASFOU124S
BOREHOLE ID: SB24-05A/M

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: C. OBrien
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/2/24

TOTAL DEPTH: 240'
DEPTH TO WATER: ~38'
GROUND SURFACE ELEVATION: 44.98'
LATITUDE: 31.270591°
LONGITUDE: -88.004052°
DATE COMPLETED: 4/9/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
25.0		2.5'/10'					No Recovery; (7.5')
30.0	15		0		Moist-Wet		SAND, well graded, tan; (3.0')

TOTAL DEPTH:	240'
DEPTH TO WATER:	~38'
GROUND SURFACE ELEVATION:	44.98'
LATITUDE:	31.270591°
LONGITUDE:	-88.004052°
DATE COMPLETED:	4/9/24



PROJECT NAME: BASFOU124S
BOREHOLE ID: SB24-05A/M

TOTAL DEPTH:	240'
DEPTH TO WATER:	~38'
GROUND SURFACE ELEVATION:	44.98'
LATITUDE:	31.270591°
LONGITUDE:	-88.004052°
DATE COMPLETED:	4/9/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
45.0	0	7.5'/10'	0				
							SAND, well graded, tan; (0.9')
							SAND and GRAVEL, well graded, light brown; (1.5')
							SAND, well graded, tan; (1.0')
							No Recovery; (2.5')
				GW (46-48')			
					Wet		SAND, well graded, tan; (1.75')
50.0	-5						SAND, well graded, brown; (5.95')

SITE LOCATION:	BASF
ADDRESS:	1379 Ciba Rd., McIntosh, AL
LOGGED BY:	C. OBrien
DRILLING COMPANY:	Walker Hill
DRILLING METHOD:	Sonic
DATE STARTED:	4/2/24

TOTAL DEPTH:	240'
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[illegible]

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ADDRESS:	1379 Ciba Rd., McIntosh, AL
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DRILLING COMPANY:	Walker Hill
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DATE STARTED:	4/2/24

TOTAL DEPTH:	240'
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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
			0				Clayey Sand
							SAND, well graded, brown; (2.8')
		6'/10'					Sand
							SAND, well graded, tan; (0.8')
							No Recovery; (4.0')
65.0	-20			GW (66-68')			
					Wet		Sand
			0				SAND, well graded, brown; (3.0')
70.0	-25						

SITE LOCATION:	BASF
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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
75.0	-30	3'/10'		GW (76-78')			No Recovery; (7.0')
					Wet-Moist		SAND, well graded, brown; (1.0')
				SOIL (79')			CLAY, gray, firm; (7.5')
80.0	-35						

BORING LOG

PROJECT NAME: BASFOU124S
BOREHOLE ID: SB24-05A/M

SITE LOCATION: BASF
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DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/2/24

TOTAL DEPTH: 240'
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DATE COMPLETED: 4/9/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
85.0	-40	8.5'/10'	0				
							No Recovery; (1.5')
90.0	-45				Moist	Clay	CLAY, gray, firm; (5.0')

TOTAL DEPTH:	240'
DEPTH TO WATER:	~38'
GROUND SURFACE ELEVATION:	44.98'
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SITE LOCATION: BASF
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DATE STARTED: 4/2/24

TOTAL DEPTH: 240'
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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
105.0	-60	6'/10'	0				CLAY, brown with gray mottling; (1.0')
							SANDY CLAY, brown with gray mottling; (2.5')
							No Recovery; (4.0')
			0		Moist		SANDY CLAY with SILT, gray with brown mottling; (1.4')
110.0	-65						SILTY SAND, gray with brown mottling; (0.5')

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
115.0	-70	9'/10'	6				SANDY CLAY with SILT, gray; (0.7')
							SILTY SAND, gray; (0.3')
							CLAYEY SAND, gray; (0.3')
			12				SILTY SAND with some CLAY, gray; (3.0')
				SOIL (114')	Wet		SILTY SAND, gray; (2.8')
			24				
							No Recovery; (1.0')
							SAND, well graded, gray; (1.7')
120.0	-75		0				SILTY SAND, with clay lenses, gray; (2.8')

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
125.0	-80		3	SOIL (121')			Sand
		7.7'10'			Moist		Silty Sand
			0				SILTY SAND, with clay lenses, gray; (2.4')
							Clay
							CLAY, gray; (0.5')
							Silty Sand
							SILTY SAND, gray; (0.3')
							No Recovery; (2.3')
130.0	-85				Moist		Sandy Clay
							SANDY CLAY, gray with brown mottling; (5.9')

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
135.0	-90	9.5'/10'	0				
					Wet		Silty Clay
					Moist		SANDY CLAY with some SAND, brown; (0.3')
							SANDY CLAY, gray with brown mottling; (3.3')
							No Recovery; (0.5')
					Moist		SANDY CLAY, gray with brown mottling; (5.0')
140.0	-95						

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
145.0	-100	10'/10'	0				
							Silty Sand
							SILTY SAND, gray; (3.2')
							Clay
							CLAY, brown; (1.0')
							Clayey Sand
							CLAYEY SAND, gray with brown mottling; (0.8')
					Moist		Silty Sand
							SILTY SAND, brown; (3.7')
150.0	-105						

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
155.0	-110	7.7'/10'	0				
							Silty Clay SILTY CLAY, gray; (4.0')
							No Recovery; (2.3')
					Mosit		Silty Sand SILTY SAND, gray; (1.4')
160.0	-115						Silty Clay SILTY CLAY, gray; (0.8')

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
			0				Silty Clay SITLY CLAY, brown; (3.2')
	8.2'/10'						Sandy Clay SANDY CLAY, gray; (0.2')
							Clayey Sand CLAYEY SAND, gray; (0.3')
							Silty Sand SILTY SAND, gray; (0.5')
							Sandy Clay SANDY CLAY, gray; (1.4')
165.0 -120							Clayey Sand CLAYEY SAND, brown; (0.4')
							No Recovery; (1.8')
					Moist		Sandy Silt SANDY SILT, gray; (2.4')
170.0 -125							

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
175.0	-130	9.2'/10'	0				
							Clay CLAY, gray; (0.5')
							
							Sandy Clay SANDY CLAY, gray with brown and red mottling; (6.3')
							No Recovery; (0.8')
					Moist		
							Sand SAND, well graded, gray; (0.5')
							
							Clayey Sand CLAYEY SAND, gray; (0.9')
180.0	-135						
							Sandy Clay SANDY CLAY, gray; (1.1')

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
185.0	-140	9.2'/10'	0		Dry	Clay	CLAY, gray; (2.8')
					Moist		
					Dry	Clay	CLAY, gray with red and brown mottling; (3.9')
							No Recovery; (0.8')
					Wet	Sand	SAND, well graded, brown; (0.6')
190.0	-145					Sand	SAND, well graded, gray; (5.5')

TOTAL DEPTH:	240'
DEPTH TO WATER:	~38'
GROUND SURFACE ELEVATION:	44.98'
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LONGITUDE:	-88.004052°
DATE COMPLETED:	4/9/24

LITHOLOGIC DESCRIPTION

TOTAL DEPTH:	240'
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SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
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DATE STARTED: 4/2/24

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DATE COMPLETED: 4/9/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
			0				
		5.5'/10'					
215.0	-170						No Recovery; (4.5')
				GW (216-218')			
					Wet		
						Sand	SAND, well graded, tan; (6.0')
220.0	-175						

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
225.0	-180	6'/10'	0				
				GW (226-228')			No Recovery; (4.0')
230.0	-185				Wet		SAND, well graded, tan; (5.3')

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
235.0	-190	7.3'/10'	0	GW (236-238')			
							Sand
							SAND, well graded, grayish-tan; (2.0')
							No Recovery; (2.7')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/19/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 25'
GROUND SURFACE ELEVATION: 44.00'
LATITUDE: 31.270582°
LONGITUDE: -88.005131°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Moist		Topsoil
							ORGANICS, grass; (0.5')
							Silty Clay
							SILTY CLAY, brown to orange; (1.5')
							Silty Clay
							SILTY CLAY, gray with orange mottling; (5.0')
40	8'8"	0					
5.0							
							Clayey Sandy Silt
							CLAYEY SANDY SILT, gray to orange; (1.0')
					Moist		Clayey Sandy Silt
							CLAYEY SANDY SILT, gray to orange; (1.7')
35							
10.0							Sand
	6'8"	0					SAND, fine grained, yellowish orange; (4.3')
30							No Recovery; (2.0')
15.0							
					Moist		Sand
							SAND, fine grained, yellowish to reddish brown; (1.5')
							Sand
							SAND, fine grained, yellowish orange; (2.2')
25							
20.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
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DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/19/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 25'
GROUND SURFACE ELEVATION: 44.00'
LATITUDE: 31.270582°
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DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
							No Recovery; (4.3)
20			0		Moist		SAND, fine grained, yellowish orange; (1.0')
25.0					Wet		SAND, fine to medium grained, tan; (7.0')
15		8'/8'	0.2				
30.0					Wet		SAND, fine to medium grained, tan; (5.5')
10			0				
35.0		5.5'/8'					
5				GW (38-40')			No Recovery; (2.5')
40.0							

SITE LOCATION: BASF
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TOTAL DEPTH: 250'
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LATITUDE: 31.270582°
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DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
45.0		9.3'/10'	0		Wet		Sand SAND, fine to medium grained, tan; (3.0')
							Sand SAND and some small GRAVEL, fine to coarse, tan; (2.0')
							Sand SAND with some CLAY content, fine to medium grained, tan; (1.5')
							Sand SAND, fine to medium grained, orange to tan; (2.8')
50.0				GW (48-50')			No Recovery; (0.7')
			0		Wet		Sand SAND, fine to medium grained, tan to yellowish orange; (2.0')
							Sand SAND, fine to medium grained, tan; (2.7')
55.0		9.5'/10'	0				Clayey Sand CLAYEY SAND lense, gray; (2.6')
					Wet		Sand SAND, fine to medium grained, tan; (2.2')
60.0				GW (58-60')			No Recovery; (0.5')

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
65.0		7.4'/10'	0		Wet		Sand with GRAVEL (at 64'), fine to medium grained, tan to yellowish orange; (4.7')
					Wet		SAND, fine to medium grained, tan; (2.7')
				GW (68-70')			No Recovery; (2.6')
70.0			0		Wet		SAND, fine to medium grained, tan; (5.0')
		9.5'/10'	0				SAND, fine to coarse grained, tan; (2.0')
			0.7	GW (78-80')	Wet		SAND with GRAVEL, fine to coarse grained, tan; (2.5')
80.0							No Recovery; (0.5')

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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
85.0		7'/10'	0.2	SOIL (85')	Wet		Sand SAND with abundant GRAVEL, fine to coarse grained, tan; (5.5')
							Clay CLAY, Miocene, bluish gray; (1.5')
							No Recovery; (3.0')
90.0					Moist		Clay CLAY, plastic, bluish gray; (9.7')
95.0		9.7'/10'	0				
							No Recovery; (0.3')

TOTAL DEPTH:	250'
DEPTH TO WATER:	25'
GROUND SURFACE ELEVATION:	44.00'
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LONGITUDE:	-88.005131°
DATE COMPLETED:	3/13/24

LITHOLOGIC DESCRIPTION

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: D. Williams
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DATE STARTED: 3/19/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 25'
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DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
125.0		8'/10'	0		Wet		Sand SAND with some SILT, fine to medium, gray; (8.0')
130.0				GW (128-130')			No Recovery; (2.0')
135.0		9.5'/10'	0		Wet		Sand SAND with some SILT, fine to medium grained, dark gray; (9.5')
140.0				GW (138-140')			No Recovery; (0.5')

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DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
145.0		5'/10'	0		Wet		SAND with some SILT, fine to medium grained, dark gray; (5.0')
							No Recovery; (5.0')
150.0				GW (148-150')			
155.0		7.6'/10'	0.3		Wet		SAND with some SILT, fine to medium grained, dark gray; (7.6')
							No Recovery; (2.4)
160.0				GW (158-160')			

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/19/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 25'
GROUND SURFACE ELEVATION: 44.00'
LATITUDE: 31.270582°
LONGITUDE: -88.005131°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					Moist		CLAYEY SAND, gray; (2.0')
				SOIL (162')			CLAY, stiff to very hard, gray; (7.0')
165.0		9'/10'	0.3				No Recovery; (1.0')
170.0					Moist		CLAY, stiff, greenish gray; (1.6')
175.0		8.5'/10'	0				SANDY SILTY CLAY, stiff, fine grained, greenish gray; (6.9')
180.0							No Recovery; (1.5')
						Sandy	

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/19/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 25'
GROUND SURFACE ELEVATION: 44.00'
LATITUDE: 31.270582°
LONGITUDE: -88.005131°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					Moist		Clay SANDY CLAY, greenish gray; (1.0')
					Moist		Clay CLAY, very stiff to hard, greenish gray; (7.0')
185.0		8'/10'	0				No Recovery; (2.0')
190.0			0		Wet		Sand SAND, fine to medium grained, tan to gray; (2.0')
							Sand SAND with some small GRAVEL, fine to medium grained with some coarse grained, gray; (3.0')
195.0		9.5'/10'					Silty Sand SILTY SAND, gray; (1.5')
			1		Wet		Sand SAND with GRAVEL, fine to coarse grained, gray; (3.0')
				GW (198-200')			No Recovery; (0.5')
200.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/19/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 25'
GROUND SURFACE ELEVATION: 44.00'
LATITUDE: 31.270582°
LONGITUDE: -88.005131°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
205.0		9'/10'	0.7		Wet		Sand SAND and small GRAVEL, fine to medium grained with some coarse grained, tan to gray; (9.0')
210.0				GW (208-210')			No Recovery; (1.0')
215.0		4'/10'	0.6				Sand SAND with trace GRAVEL, fine to medium grained with some coarse grained, tan to gray; (4.0')
220.0				GW (218-220')			No Recovery; (6.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: D. Williams
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 3/19/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 25'
GROUND SURFACE ELEVATION: 44.00'
LATITUDE: 31.270582°
LONGITUDE: -88.005131°
DATE COMPLETED: 3/13/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
225.0		9'/10'	0		Wet		Sand SAND with some GRAVEL, fine to medium grained with some coarse grained, tan to orange; (2.5')
180							
230.0				GW (228-230')			Sand SAND with some small GRAVEL, fine to medium grained with some coarse grained, tan to gray; (6.5')
185							No Recovery; (1.0')
235.0		9'/10'	0		Wet		Sand SAND and abundant GRAVEL, fine to medium grained with some coarse grained, tan to gray; (9.0')
190							
240.0				GW (238-240')			No Recovery; (1.0')
195							

TOTAL DEPTH:	250'
DEPTH TO WATER:	25'
GROUND SURFACE ELEVATION:	44.00'
LATITUDE:	31.270582°
LONGITUDE:	-88.005131°
DATE COMPLETED:	3/13/24

250.0

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Moist		
4.0							
5.0		10'/10'	0				Silty Clay SILTY CLAY, some organics, medium stiffness, medium plasticity, orange with red and tran mottling; (8.0')
3.5							
10.0							Silty Clay SILTY CLAY, some organics, increasing fine grained sand, medium stiffness, medium plasticity, orange with red and tran mottling; (2.0')
3.0							No Recovery; (5.0')
15.0		5'/10'			Moist		Sand SAND, fine grained, orange with red mottling; (5.0')
2.5			0				
20.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
20							No Recovery; (5.0')
25.0		5'/10'			Moist		SAND, fine grained, light tan; (5.0')
15			0				
30.0					Moist		SAND, fine grained with some medium grained sand, light tan; (5.0')
10							
35.0		10'/10'	0				SAND, fine grained with increasing medium grained sand; (5.0')
5					Very Moist		
40.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0					Very Moist		Sand
45.0	10'/10'	0			Wet		SAND, medium grained with some fine grained; (5.0')
-5							Sand
50.0				GW (48-50')			SAND, medium grained with some small gravel; (3.0')
-10							Sand
55.0	10'/10'	0			Wet		SAND, medium grained with some clay; (2.0')
-15							Sand
60.0				GW (56-58')			SAND, medium grained; (5.0')
							Sand
							SAND, medium grained and small gravel; (5.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
							No Recovery; (4.0')
65.0		6'/10'			Wet		SAND, medium grained, tan; (6.0')
			BLANK	GW (66-68')			
70.0							No Recovery; (5.0')
		5'/10'			Wet		SAND, medium grained with small to medium gravel increasing to 80'; (5.0')
			BLANK	GW (76-78')			
80.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
40					Wet		Sand
85.0	10'/10'	0		SOIL (84')	Moist		SANDY CLAY, medium stiffness, medium plasticity, gray with brown mottling; (3.0')
45							SANDY CLAY, medium stiffness, medium plasticity, decreasing sand with depth, gray with brown mottling; (3.0')
90.0					Moist		SANDY CLAY, medium stiffness, medium plasticity, gray with brown mottling; (10.0')
50							
95.0	10'/10'	0					
55							
100.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
105.0		10'/10'	0		Moist		SANDY CLAY, medium stiffness, medium plasticity, brown and maroon mottling; (9.0')
110.0							SAND, fine grained, gray; (1.0')
115.0		10'/10'	0		Moist		SANDY CLAY, gray with brown and dark red mottling; (10.0')
120.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
125.0		10'/10'	0		Wet		Sand SAND, fine grained, light gray; (10.0')
130.0				SOIL (129')			
135.0		10'/10'	0		Wet		Sand SAND, fine grained, light gray; (4.0')
				GW (136-138')			
140.0							Sand SAND, fine grained with some medium grained sand, light gray; (6.0')

SITE LOCATION:	BASF
ADDRESS:	1379 Ciba Rd., McIntosh, AL
LOGGED BY:	A. Gilchrist
DRILLING COMPANY:	Walker Hill
DRILLING METHOD:	Sonic
DATE STARTED:	4/29/24

TOTAL DEPTH:	250'
DEPTH TO WATER:	43'
GROUND SURFACE ELEVATION:	42.27'
LATITUDE:	31.270559°
LONGITUDE:	-88.005713°
DATE COMPLETED:	5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-100							
145.0	BLANK	BLANK					
-105							
				GW (146-148')			
150.0							
-110							
155.0	10'/10'	0					
-115							
160.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
165.0		10'/10'	0		BLANK		Sandy Clay SANDY CLAY, medium stiffness, medium plasticity, less sand than above, gray with brown mottling; (2.0')
					Moist		Sand SAND lense, fine grained, gray; (1.0')
					BLANK		Clay CLAY, stiff, high plasticity, gray; (3.0')
					Moist-Very		Sand SAND lense, fine grained, gray; (1.0')
					Moist BLANK		Clay CLAY, stiff, high plasticity, dark red with gray mottling; (3.0')
170.0							No Recovery; (3.0')
175.0		7'/10'	0		Moist		Sandy Clay SANDY CLAY, fine grained, medium gray; (7.0')
180.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION		
					Moist			Sand	SAND lense, fine grained, gray; (2.0')
					BLANK			Clay	CLAY, stiff, high plasticity, dark red with gray mottling; (6.0')
185.0		10'/10'	0					Clay	CLAY, stiff, high plasticity, more sand than above, dark red with gray mottling; (2.0')
									No Recovery; (3.0')
					BLANK			Sandy Clay	SANDY CLAY, medium stiffness, medium plasticity, fine grained, dark brown with gray mottling; (7.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
205.0		10'/10'	0		BLANK		Sandy Clay SANDY CLAY, medium stiffness, medium plasticity, fine grained, dark brown with gray mottling; (3.0')
					Very Moist		Sandy Clay SANDY CLAY, medium stiffness, medium plasticity, fine grained, more sand than above, dark brown with gray mottling; (2.0')
					Wet		Sandy Clay SANDY CLAY, medium stiffness, medium plasticity, fine grained, gray; (3.0')
210.0					Wet		Sand SAND, fine to medium grained, gray; (2.0')
215.0		10'/10'	0				Sand SAND, fine to medium grained, gray; (10.0')
220.0				GW (218-220')			

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
							No Recovery; (5.0')
225.0		5'/10'			Wet		
			0	GW (226-228')			SAND and some small gravel, fine to medium grained, gray; (4.0')
230.0					Wet		SAND and some small gravel, fine to medium grained, gray to light gray; (1.0')
		BLANK	BLANK				SAND and some small gravel, medium grained, light gray; (10.0')
235.0				GW (236-238')			
240.0							

BORING LOG

PROJECT NAME: BASFOU124S
BOREHOLE ID: SB24-07A/M

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/29/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 43'
GROUND SURFACE ELEVATION: 42.27'
LATITUDE: 31.270559°
LONGITUDE: -88.005713°
DATE COMPLETED: 5/7/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
245.0		10'/10'	0		Wet		Sand
-200							
-205				GW (246-248')			
250.0							SAND and some small gravel, medium grained, light gray; (10.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
0.0					Moist		
45			0				Silty Clay SILTY CLAY, some organics, medium stiffness, gray with orange mottling; (6.0')
5.0	6'/10'						No Recovery; (4.0')
40							
10.0							Silty Clay SILTY CLAY, some organics, medium stiffness, increasing sand, orange with gray and red mottling; (5.0')
35			0				
15.0	9'/10'				Moist		Clayey Sand CLAYEY SAND, very fine grained sand, light tan with orange mottling; (4.0')
30							No Recovery; (1.0')
20.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
25							No Recovery; (6.0')
25.0		4'/10'					
20			0		Moist		SAND, fine grained, yellow with orange mottling; (4.0')
30.0							
15					Moist-Wet		SAND, fine to medium grained, yellow with orange mottling; (10.0')
35.0		10'/10'	0				
10							
40.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
5					Moist-Wet		
45.0		10'/10'	0		Wet		
0				GW (46-48')			
50.0					Wet		
55.0		10'/10'	0				
-10				GW (56-58')			
60.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-15					Wet		
65.0	10'/10'	0		GW (66-68')			Sand SAND, medium to coarse grained with decreasing clay, light tan grading to tan, some medium gravel at 68 feet; (8.0')
-20							
70.0	10'/10'	0			Wet		Sand SAND, medium to coarse grained, light tan grading to tan with orange mottling in clay; (6.0')
-25							
75.0	10'/10'	0		GW (76-78')			Sand SAND, medium grained, little gravel, orange; (1.0')
-30							Sand SAND, medium grained, increasing coarse sand and gravel, orange; (7.0')
80.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					Wet		
				SOIL (83')	Moist		
85.0	10'/10'	0					Clay
							CLAY, stiff, high plasticity, gray with brown streaking; (7.0')
90.0					Moist		
							CLAY
							CLAY, stiff, high plasticity, increasing sand, gray with brown streaking; (5.0')
95.0	10'/10'	0					
							Sandy Clay
							SANDY CLAY, fine grained, gray; (5.0')
100.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
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DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
							No Recovery; (5.0')
105.0		5'/10'			Moist-Wet		SAND, fine grained, light gray, odor; (6.0')
			10.9				
				SOIL (109')			
110.0					Moist		
115.0		10'/10'	0.5				SANDY CLAY, medium plasticity, medium stiffness, light gray; (9.0')
120.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-75					Moist		Sandy Clay SANDY CLAY, medium plasticity, medium stiffness, decreasing clay, light gray; (2.0')
125.0		10'/10'	0		Moist-Very Moist		Clayey Sand CLAYEY SAND, gray; (8.0')
-80							
130.0					Wet		Clayey Sand CLAYEY SAND, increasing grain size, decreasing clay content, gray; (8.0')
-85							
135.0		10'/10'	0				
-90							
140.0				GW (138-140')			Sand SAND, fine grained, gray; (12.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH:	250'
DEPTH TO WATER:	42'
GROUND SURFACE ELEVATION:	45.87'
LATITUDE:	31.272323°
LONGITUDE:	-88.006222°
DATE COMPLETED:	4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-95							
145.0	10'/10'	0					
-100							
				GW (146-148')			
150.0							
-105							
155.0	10'/10'	6.9					
-110							
				GW (156-158')			
160.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					Wet		
			0.7				
165.0		10'/10'		SOIL (164')	Moist		Clay
			0.0				CLAY, high plasticity, high stiffness, blue gray; (4.0')
170.0							Clay
							CLAY, with increasing fine grained SAND, high plasticity, high stiffness, blue gray; (4.0')
175.0		10'/10'	0		Moist		Sandy Clay
							SANDY CLAY, fine grained, medium plasticity, medium stiffness, gray with purple and red mottling; (10.0')
180.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
					Moist		
					Very Moist		
185.0		10'/10'	0		Moist		CLAYEY SAND, no odor; (2.0')
190.0					Moist		SANDY CLAY, fine grained, medium plasticity, stiff, gray with red and orange mottling; (8.0')
195.0		10'/10'					CLAYEY SAND, blue gray; (4.0')
200.0							SANDY CLAY, fine grained, medium plasticity, stiff, blue gray; (4.0')

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
-155					Moist		Sandy Clay
							SANDY CLAY, fine grained, medium plasticity, stiff, decreasing sand, blue gray; (2.0')
205.0	10'/10'	0					Clay
							CLAY, high plasticity, stiff, gray with red and dark brown mottling; (8.0')
210.0					Moist		Clay
							CLAY, high plasticity, stiff, gray; (9.0')
215.0	10'/10'						Clayey Sand
							CLAY SAND, fine grained; (1.0')
220.0							

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
							No Recovery; (7.0')
225.0		3'/10'					
			0		Moist-Wet		SANDY CLAY, fine grained, gray; (3.0')
230.0					Moist-Wet		SANDY CLAY, fine grained, decreasing clay, gray; (2.0')
			0		Wet		SAND, fine grained, light gray; (8.0')
235.0		10'/10'					
				GW (236-238')			
240.0							

BORING LOG

PROJECT NAME: BASFOU124S
BOREHOLE ID: SB24-08A/M

SITE LOCATION: BASF
ADDRESS: 1379 Ciba Rd., McIntosh, AL.
LOGGED BY: A. Gilchrist
DRILLING COMPANY: Walker Hill
DRILLING METHOD: Sonic
DATE STARTED: 4/17/24

TOTAL DEPTH: 250'
DEPTH TO WATER: 42'
GROUND SURFACE ELEVATION: 45.87'
LATITUDE: 31.272323°
LONGITUDE: -88.006222°
DATE COMPLETED: 4/23/24

DEPTH (ft)	SURF. ELEVATION	RECOVERY	PID	SAMPLE(S)	MOISTURE CONTENT	WATER LEVEL	LITHOLOGIC DESCRIPTION
							No Recovery; (5.0')
245.0		5'/10'			Wet		SAND, fine to medium grained, light gray; (4.0')
				GW (246-248')			
250.0							SAND, fine to medium grained, some small gravel, light gray; (1.0')

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

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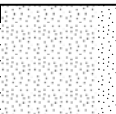
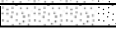
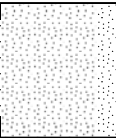
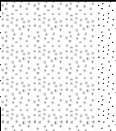
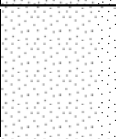
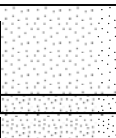
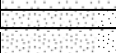
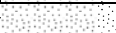
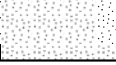
LOG OF BORING SBMIO19-1

(Page 2 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 3/26/19
Date Completed : 4/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
30								
31						SP		Light brown fine to medium SAND. (30")
32						SP		White medium to coarse SAND. (6")
33								No Recovery
34								
35		3.0'/10'			wet			
36								
37								
38								
39								
40								
41						SP		Orange fine to medium SAND. (36")
42								
43								
44						SP		Light brown fine to medium SAND. (36")
45		9.0'/10'			wet			
46								
47						SW		Light brown / orange fine to medium SAND with some coarse sand, trace subrounded fine gravel. (36")
48								
49								No Recovery
50								
51						SW		Orange fine to coarse SAND. (24")
52						SP		Light brown to orange fine SAND. (5")
53						SP		Same as above with clay and fine gravel. (7")
54						SP		Light brown fine to medium SAND. (24")
55		5.0'/10'			wet			
56								No Recovery
57								
58								
59								
60								

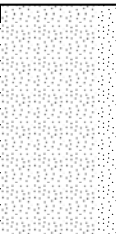
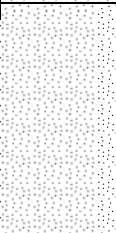
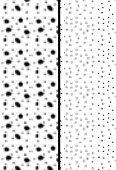
LOG OF BORING SBMIO19-1

(Page 3 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 3/26/19
Date Completed : 4/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
60								
61								
62								
63								
64								
65		8.0'/10'			wet	SP		Light gray fine to medium SAND. Trace fine subrounded gravel. (120")
66								
67								
68								
69								
70								
71								
72								
73								
74								
75		8.0'/10'			wet	SP		Same as above, increasing gravel content. (66")
76								
77						GP		Fine to medium GRAVEL and coarse SAND with medium sand. (24")
78						SP		Brown / orange medium to coarse SAND with fine gravel. (6")
79								No Recovery
80								
81								
82					wet	GP/SP		Fine to medium brown GRAVEL and coarse SAND. (48")
83								
84								
85		9.6'/10'			moist	CL		Hard gray CLAY. (6")
86								
87								
88								
89								
90								No Recovery

LOG OF BORING SBMIO19-1

(Page 4 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 3/26/19
Date Completed : 4/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

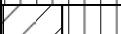
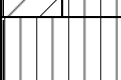
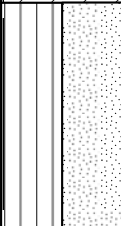
Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
90								
91								
92								
93								
94								
95		10'/10'			moist	CL		Gray stiff CLAY. Some orange streaking from 95' to 100'. (120")
96								
97								
98								
99								
100								
101								
102								
103								
104								
105		10'/10'			moist/dry	CL		Gray / red hard CLAY. (120")
106								
107								
108								
109								
110								
111								
112								
113								
114								
115		10'/10'			moist	CL		Gray / blue firm-stiff CLAY. (120")
116								
117								
118								
119								
120								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 3/26/19
Date Completed : 4/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
120		10'/10'			moist	ML		Stiff blue/gray SILT with clay. (24")
121						CL		Hard blue / gray CLAY with silt. (48")
122								
123								
124		10'/10'			moist/dry	ML		Stiff blue / gray SILT with clay. (24")
125								
126						CL		Same CLAY as above. (24")
127								
128		10'/10'			moist/dry	CL		Blue / gray CLAY with some silt. (54")
129								
130						ML		Blue / gray SILT with some clay. (8")
131								
132		10'/10'			moist/dry	CL		Blue / gray CLAY, trace silt. (46")
133								
134						ML		Blue / gray SILT, trace very fine sand and clay. (12")
135								
136		10'/10'			moist/dry	CL/ML		Green-blue CLAY / SILT. (12")
137						ML		Green / blue SILT with very fine sand and clay. (18")
138						CL		Green / blue CLAY with brown streaking. (30")
139								
140		10'/10'			moist/dry	ML/SP		Very hard, crumbly green / blue SILT / v.f. SAND and CLAY. (60")
141								
142								
143								
144								
145								
146								
147								
148								
149								
150								

LOG OF BORING SBMIO19-1

(Page 6 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 3/26/19
Date Completed : 4/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
150		10'/10'			moist/dry ↓	ML/SP		Same as above. (72")
151								
152								
153								
154								
155		10'/10'			↓ moist	ML/SP		Green-blue SILT and very fine SAND, trace clay. (6")
156								Gray very fine to fine SAND. (2")
157								Hard blue/green CLAY with silt and very fine sand. (40")
158								
159								
160		10'/10'			moist	SP		Greenish fine to very fine SAND. (6")
161								Hard blue-green CLAY, trace silt. (86")
162								
163								
164								
165		10'/10'			dry/moist	CL		
166								
167								
168								
169								
170		10'/10'			moist	SP		Blue-gray very fine to medium SAND. (10")
171								Blue-gray CLAY. (18")
172								
173								
174								
175		10'/10'			↑ moist	CL		Blue/gray CLAY with orange streaks. (114")
176								
177								
178								
179								
180						SP		Hard packed, gray, very fine to fine SAND. (6")

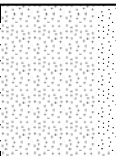
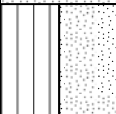
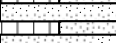
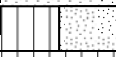
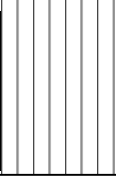
LOG OF BORING SBMIO19-1

(Page 7 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 3/26/19
Date Completed : 4/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
180								
181								
182			GW Sample @182'					
183					moist	SP		Same SAND as above. (42")
184						ML		Gray SILT with very fine sand. (18")
185		10'/10'						
186								
187								
188					dry	CL		Gray hard CLAY with silt. Some brown streaking present. (60")
189								
190								
191								
192					moist	CL		Gray CLAY, trace silt. (48")
193								
194								
195		10'/10'			wet	SP		Gray fine SAND with silt. (18")
196								
197					moist	ML/SP		Green / gray SILT and fine to very fine SAND. (30")
198			Attempted GW Sample 196'-200' (no yield)					
199					wet	SP		Gray fine SAND. (5")
200					moist	ML/SP		Gray fine SAND. (4")
201								
202					moist	ML		Gray/green SILT and fine SAND. (12") Blue/green SILT with fine sand and clay. (48")
203								
204								
205		10'/10'			moist/dry			Hard brown CLAY with gray streaks. (44")
206								
207								
208					moist			Gray fine SAND. (4")
209								No Recovery
210								

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

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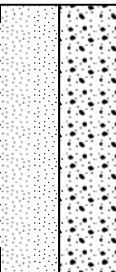
LOG OF BORING SBMIO19-1

(Page 9 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 3/26/19
Date Completed : 4/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.273959, -88.002422

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
240		6.0'/10'	GW Sample @ 250'		wet	SP/GP		Gray fine to medium SAND with fine gravel. (72")
241								
242								
243								
244								
245								
246								
247								No Recovery
248								
249								
250								
251								End of Boring
252								All casings were removed and boring was grouted with a tremie pipe to ground surface using cement grout. No PID measurements are reported at this location due to instrument malfunction.
253								
254								
255								
256								
257								
258								
259								
260								
261								
262								
263								
264								
265								
266								
267								
268								
269								
270								

LOG OF BORING SBMIO19-2

(Page 1 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
0		4.0'/5.0'		0.0	moist	ML/SP		Brown SAND/SILT/CLAY. (36")
1								
2								
3		4.0'/5.0'		0.0	wet	ML		Gray SILT, very loose. (12")
4								
5								No Recovery
6		4.0'/5.0'		0.0	wet	ML		Gray SILT with some sand. (6")
7								
8								
9		4.0'/5.0'		0.0	moist	CL		Brown/gray CLAY with orange mottling. Silt and fine sand present. (42")
10								
11								No Recovery
12		5.0'/10'		0.0	moist	CL		Same soft CLAY as above with silt and fine sand. (60")
13								
14								
15		5.0'/10'		0.0				No Recovery
16								
17								
18		10'/10'		0.0	moist	CL		Fat gray CLAY. (120")
19								
20								
21		10'/10'		0.0				
22								
23								
24		10'/10'		0.0	moist	CL		
25								
26								
27		10'/10'		0.0				
28								
29								
30		10'/10'		0.0				

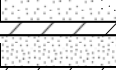
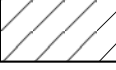
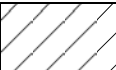
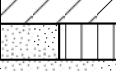
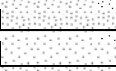
LOG OF BORING SBMIO19-2

(Page 2 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
30		7.5'/10'		0.0	moist	CL		Same CLAY as above. (18")
31						CL		Same CLAY with fine gravel. (1")
32						SW		Fat gray CLAY. (8")
33								Gray medium SAND. (14")
34						SP		Soft gray CLAY. (4")
35						SP		Gray fine to medium SAND. (8")
36								Gray CLAY with silt and fine sand. (1")
37						CL		Gray fine to medium SAND. (13")
38		6.6'/10'			moist			Gray/orange CLAY with silt and fine sand. (22")
39								No Recovery
40								
41						CL		Gray CLAY with silt and fine sand. Compressed organic layer at ~42'. (24")
42						SP/ML		Orange fine SAND/SILT with some clay. (10")
43						SP		Gray fine to medium SAND. (11")
44						SW		Burnt orange medium SAND, very compacted. (10")
45						SP		Brown fine to coarse SAND. (24")
46		5.7'/10'		0.0	wet			Burnt orange medium SAND, compacted. (1")
47								No Recovery
48								
49								
50								
51						SP		Orange fine to medium SAND with some coarse sand. (19")
52								Light gray/tan fine to medium SAND, trace coarse sand. (49")
53						SP		
54					wet			No Recovery
55								
56								
57								
58								
59								
60								

LOG OF BORING SBMIO19-2

(Page 3 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
60		5.6'/10'		0.0	↑	SP/GP		Light brown/gray fine to medium SAND, fine gravel mixed in from 61.5' to 62.4'. (29")
61						SP		Light orange fine to medium SAND. (12")
62						SP		Light gray / tan fine to medium SAND, trace coarse sand. (26")
63								No Recovery
64		9.0'/10'		0.0	↑			No Recovery
65								No Recovery
66								No Recovery
67								No Recovery
68		7.0'/10'		0.1	↓	SP		Same as above. (48")
69								No Recovery
70								No Recovery
71								No Recovery
72		7.0'/10'		9.3	↓	SP/GP		Tan medium to coarse SAND and fine GRAVEL. Trace fine sand. (60")
73								No Recovery
74								No Recovery
75								No Recovery
76		7.0'/10'		0.1	↓			No Recovery
77								No Recovery
78								No Recovery
79								No Recovery
80		7.0'/10'		0.1	↓	SP/GP		Same as above, increasing orange color from 82' to 83.7'. (44")
81								No Recovery
82								No Recovery
83								No Recovery
84		7.0'/10'		0.1	↓	CL		Gray / brown firm CLAY. (13")
85								No Recovery
86								No Recovery
87								No Recovery
88		7.0'/10'		0.1	↓	ML/SP		Gray SILT / fine SAND. (26")
89								No Recovery
90								No Recovery
91								No Recovery

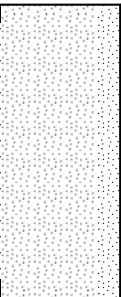
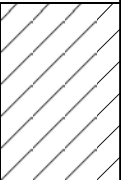
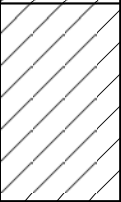
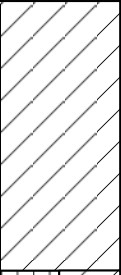
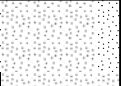
LOG OF BORING SBMIO19-2

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BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

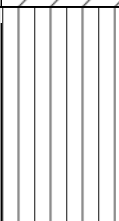
Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
90		8.7'/10'		0.0	wet	SP		Gray fine SAND, trace silt'. (79")
91								
92								
93								
94		10'/10'		0.0	moist	CL		Firm gray CLAY. (7")
95					wet	ML		Gray SILT with clay and fine sand. (18")
96								No Recovery
97								
98		10'/10'		0.0	moist/dry	CL		Hard blue/gray CLAY with brown streaking. (48")
99								
100					moist	CL		Softer blue gray CLAY with silt and fine sand. (53")
101								
102		10'/10'		0.0	moist/dry	CL		Hard blue/gray CLAY with brown streaking. (19")
103					moist	ML		Light gray SILT with clay and fine sand. (12")
104					moist/dry	CL		Hard gray / blue CLAY with brown streaks. (72")
105								
106		10'/10'		0.0	moist	ML/CL		Gray SILT / CLAY. (12")
107					moist/wet	SP		Gray very fine SAND with silt, trace clay. (24")
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
120		10'/10'		0.0	dry	CL		Gray CLAY with brown streaking. Silt and very fine sand in clay. (60")
121								
122								
123								
124								
125								
126		10'/10'		0.0	dry/moist	ML/SP		Gray SILT and very fine SAND, some clay. (60")
127								
128								
129								
130								
131								
132	10'/10'	0.0	moist	ML/SP		Same as above. (28")		
133								
134								
135								
136								
137								
138	10'/10'	0.0	moist/dry	CL		Gray CLAY with silt and fine sand. (20")		
139								
140								
141								
142								
143								
144	10'/10'	0.0	↑	ML		Blue / gray SILT with fine sand and clay. (84")		
145								
146								
147								
148								
149								
150			moist	CL		Gray CLAY with brown streaking, some silt but much less than above. (36")		

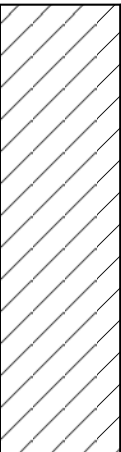
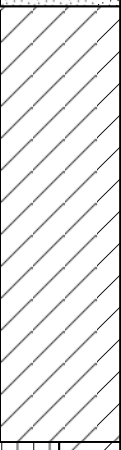
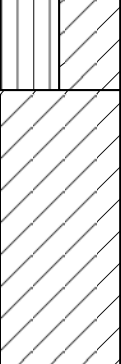
LOG OF BORING SBMIO19-2

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BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
150		10'/10'		0.0	moist	CL		Hard gray CLAY with red and brown streaks. (72")
151								
152								
153								
154								
155		10'/10'		0.0	dry	CL		Tan fine SAND. (4")
156								Very hard gray CLAY, with brown and red streaking. Increasing red color from 166' to 170'. (116")
157								
158								
159								
160		10'/10'		0.0	dry	ML/CL		Blue/gray SILT/CLAY. (29")
161								
162								
163								
164								
165		10'/10'		0.0	dry	CL		Hard blue / gray CLAY with silt and fine sand. (6")
166								
167								
168								
169								
170		10'/10'		0.0	dry	SP/ML		Very tight gray fine to very fine SAND and SILT. (10")
171								Blue / gray SILT/CLAY with brown streaks. (7")
172								
173								
174								
175		10'/10'		0.0	dry	ML/CL		
176								
177								
178								
179								
180								

LOG OF BORING SBMIO19-2

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BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

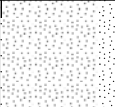
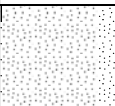
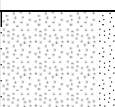
Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
180								
181					dry	ML/CL		Blue / gray SILT/CLAY. (12")
182					dry	SP		Blue / gray fine to very fine SAND with silt and clay. (10")
183								
184								
185		10'/10'		0.0				
186					dry	CL		Very hard gray CLAY with red / brown mottling. (98")
187								
188								
189								
190								
191								
192					moist	CL		Gray CLAY, softer than above. (54")
193								
194								
195		10'/10'		0.0				
196					dry	CL		Very hard gray CLAY. (28")
197								
198					dry	ML/SP		Hard packed gray SILT / SAND with clay. (23")
199								
200						SP		Gray very fine to medium SAND. (5")
201								
202								
203								
204								
205		7.0'/10'		0.0				
206			GW Sample (205'-207')			SP		Gray fine to medium SAND, some coarse sand and fine gravel. Trace silt present. (84")
207								
208								No Recovery
209								
210								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

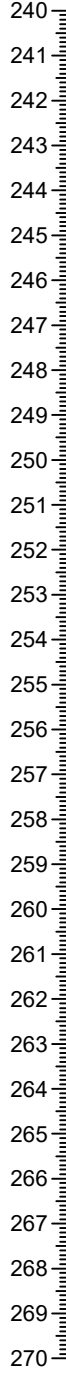
Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
210								
211						SP		Gray fine to medium SAND, trace silt, coarse sand and fine gravel. (30")
212								
213								
214								
215		2.5'/10'		0.0				No Recovery
216								
217								
218			GW Sample (218'-220')					
219								
220								
221						SP		Gray fine to coarse SAND with some fine gravel, trace silt and clay. (55")
222								
223								
224								
225		4.6'/10'		0.0				No Recovery
226								
227								
228								
229								
230								
231			GW Sample (230'-232')					
232								
233								
234						SP		Gray medium to coarse SAND with fine gravel. Trace fine sand, silt and clay. (102")
235		6.0'/10'		0.0				
236								
237								
238								
239			GW Sample (238'-240')			CL		Hard gray CLAY. (18")
240								

wet
moist/dry

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/8/19
Date Completed : 4/10/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 250'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.270813, -88.001378

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
240		10'/10'		0.0	moist/dry	CL		Gray hard CLAY, red streaking near 250'. (120")
241								
242								
243								
244								
245								
246								
247								
248								
249								
250								
251								End of Boring All casings were removed and boring was grouted with a tremie pipe to ground surface using cement grout.
252								
253								
254								
255								
256								
257								
258								
259								
260								
261								
262								
263								
264								
265								
266								
267								
268								
269								
270								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/17/19
Date Completed : 5/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 210'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.271049, -88.005296

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
0								Blind Drill to 60'.
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/17/19
Date Completed : 5/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 210'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.271049, -88.005296

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
30								Blind drill to 60' (continued).
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								

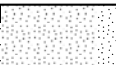
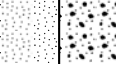
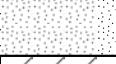
LOG OF BORING SBMIO19-3

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BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/17/19
Date Completed : 5/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 210'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.271049, -88.005296

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
60		7.0'/10'		0.0	↑	SP		Light brown fine to medium SAND, trace coarse sand and fine gravel. (24")
61						SP		Light brown fine to coarse SAND, trace fine gravel. (41")
62						SP		Light brown medium to coarse SAND. Some fine gravel and trace fine sand. (19")
63								No Recovery
64		9.0'/10'		0.0	↓	SP		Light brown medium to coarse SAND, trace fine gravel and fine sand. (43")
65						SP/GP		Brown/orange medium to coarse SAND and fine gravel. (53")
66						SP/GP		Orange coarse SAND and fine GRAVEL, trace medium sand. (12")
67								No Recovery
68		5.7'/10'		0.0	↓	SP		Brown fine to medium SAND, some coarse sand and fine gravel. (19")
69						SP		Brown fine to coarse SAND with fine gravel. (19")
70						CL		Hard gray CLAY with silty seam at 84.6'. (30")
71								No Recovery
72								
73								
74								
75								
76								
77								
78								
79								
80								
81								
82								
83								
84								
85								
86								
87								
88								
89								
90								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/17/19
Date Completed : 5/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 210'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.271049, -88.005296

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
90								Blind drill from 90' to 120'. Driller suggests that soil is clay (based on resistance).
91								
92								
93								
94								
95								
96								
97								
98								
99								
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/17/19
Date Completed : 5/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 210'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.271049, -88.005296

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
120								Blind drill from 120' to 150'. Driller suggests soil is sand, based on resistance.
121								
122								
123								
124								
125			GW Sample (125'-127')					
126								
127								
128								
129								
130								
131								
132								
133								
134								
135								
136								
137								
138								
139								
140								
141			GW Sample (141'-143')					
142								
143								
144								
145								
146			GW Sample (146'-148')					
147								
148								
149								
150								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/17/19
Date Completed : 5/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

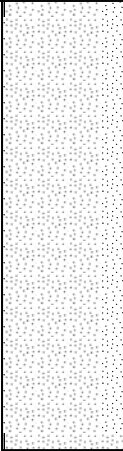
Total Logged Depth : 210'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.271049, -88.005296

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
150								Blind drill from 150' to 200'. Driller suggests soil is clay, based on resistance.
151								
152								
153								
154								
155								
156								
157								
158								
159								
160								
161								
162								
163								
164								
165								
166								
167								
168								
169								
170								
171								
172								
173								
174								
175								
176								
177								
178								
179								
180								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/17/19
Date Completed : 5/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 210'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.271049, -88.005296

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
180								Blind drill (continued).
181								
182								
183								
184								
185								
186								
187								
188								
189								
190								
191								
192								
193								
194								
195								
196								
197								
198								
199								
200		10'/10'	GW Sample (206'-208')	0.0	wet	SP		Gray fine to medium SAND. (120")
201								
202								
203								
204								
205								
206								
207								
208								
209								
210								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 4/17/19
Date Completed : 5/2/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 210'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.271049, -88.005296

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
210								Interval not logged. Push ahead probe used to collect water sample at bottom of this interval.
211								
212								
213								
214								
215								
216								
217								
218								
219								
220			GW Sample (@220')					End of Boring All casings were removed and boring was grouted with a tremie pipe to ground surface using cement grout.
221								
222								
223								
224								
225								
226								
227								
228								
229								
230								
231								
232								
233								
234								
235								
236								
237								
238								
239								
240								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB
Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
0								Blind drill to 90'.
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
30								Blind drill to 90' (continued).
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

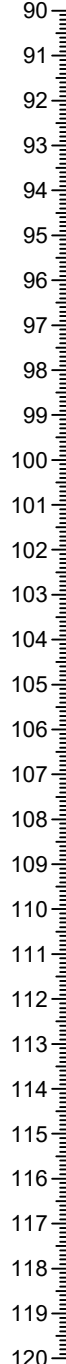
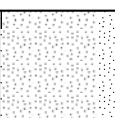
Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
60								Blind drill to 90' (continued).
61								
62								
63								
64								
65								
66								
67								
68								
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
80								
81								
82								
83								
84								
85								
86								
87								
88								
89								
90								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
90		10'/10'		0.0	wet	SP		Brown fine to medium SAND with some coarse sand and fine gravel. (30")
91								
92					moist	CL		Gray medium soft CLAY. (90")
93								
94								
95								
96								
97								
98								
99								
100				0.0				Blind drill to 190'
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
120								Blind drill to 190' (continued).
121								
122								
123								
124								
125								
126								
127								
128								
129								
130								
131								
132								
133								
134								
135								
136								
137								
138								
139								
140								
141								
142								
143								
144								
145								
146								
147								
148								
149								
150								

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
150								Blind drill to 190' (continued).
151								
152								
153								
154								
155								
156								
157								
158								
159								
160								
161								
162								
163								
164								
165								
166								
167								
168								
169								
170								
171								
172								
173								
174								
175								
176								
177								
178								
179								
180								

LOG OF BORING SBMIO19-4

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BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
180								Blind drill to 190' (continued).
181								
182								
183								
184								
185								
186								
187								
188								
189								
190								
191								
192								
193								
194								
195								
196								
197								
198								
199								
200								
201								
202								
203								
204								
205								
206								
207								
208								
209								
210								No Recovery

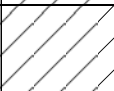
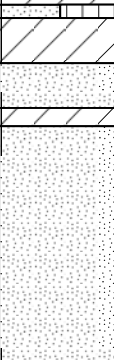
LOG OF BORING SBMIO19-4

(Page 8 of 9)

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB

Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION				
210		10'/10'		0.0	moist/dry	CL		Hard blue/gray CLAY with red and brown streaking. (90")				
211												
212												
213												
214												
215												
216												
217												
218		7.0'/10'			moist/dry	CL		Hard blue/gray CLAY. (30")				
219												
220					moist	CL		Gray firm CLAY, trace silt. (24")				
221												
222												
223					wet	SP		Gray fine to very fine SAND and SILT. (4")				
224								Gray medium soft CLAY. (12")				
225								Gray fine to very fine SAND with silt. (12")				
226								Gray medium soft CLAY. (5")				
227								Gray fine to medium SAND, some coarse sand and gravel. (64")				
228												
229												
230												
231								Interval not logged. Push ahead probe used to collect groundwater sample from this interval.				
232												
233												
234												
235												
236												
237												
238												
239												
240												

BASF
1379 Ciba Rd.
McIntosh, AL, 36553

Date Started : 5/3/19
Date Completed : 5/9/19
Drilling Method : Sonic
Drilling Contractor : Walker Hill
Logged By : CB
Total Logged Depth : 230'
Water Depth : n/a
Ground Elevation :
Lat/Long : 31.27278, -88.00464

Depth in Feet	Surf. Elev.	Recovery (in.)	Sample Type	PID (ppm)	Moisture Content	USCS	GRAPHIC	DESCRIPTION
240			GW Sample (240'-242')					
241								
242								
243								End of Boring
244								All casings were removed and boring was grouted with a tremie pipe to ground surface using cement grout.
245								
246								
247								
248								
249								
250								
251								
252								
253								
254								
255								
256								
257								
258								
259								
260								
261								
262								
263								
264								
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266								
267								
268								
269								
270								