Technical Specifications – Issued for Bid

Waterway Estates Water Treatment Plant - Plant Demolition
AND
Fort Myers Beach Wastewater Treatment Plant – Plant Selective Demolition

Lee County Utilities

October 2020

TECHNICAL SPECIFICATIONS
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REFERENCE DOCUMENTS

Contractor shall complete all work in conformance with the Lee County Utilities Design Manual, latest revision, and as provided herein these technical specifications. The latest version of the Design Manual is available at the Lee County website: https://www.leegov.com/utilities/design-manual

All utility related materials shall comply with Lee County Utility's Approved Materials List: http://www.leegov.com/utilities/design-manual/approved-materials

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SUMMARY OF WORK

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1.02 DESCRIPTION OF WORK

A. Work of this contract includes the demolition of select facilities as generally described, shown, and specified in Contract Documents entitled “Waterway Estates Water Treatment Plant – Plant Demolition;” and “Fort Myers Beach Wastewater Treatment Plant – Plant Selective Demolition.”

B. Work is to be performed at the location as follows:

1. Waterway Estates Water Treatment Plant (WWE WTP) located at 4276 St Clair Ave W, North Fort Myers, FL 33903; and,

2. Fort Myers Beach Wastewater Treatment Plant (FMB WWTP) located at 17155 Pine Ridge Rd, Fort Myers Beach, FL 33931

C. Perform Work under a unit price contract with OWNER.

D. Work not specifically identified on the Drawings or in the Bid Item Description pages, but required in the Contract Documents, shall be performed as specified.

E. The Work includes, but not limited to, the following:

1. Furnishing of all labor, material, superintendence, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, services and other means of construction and/or demolition necessary or proper for performing and completing the Work.

2. Sole responsibility for adequacy of plant and equipment.

3. Maintaining the Work area and site in a clean and acceptable manner.

4. Maintaining existing in-service facilities as in-service at all times except where specifically provided for otherwise herein.

5. Working around, protection of, and disconnections from existing in-service piping. Disconnection from existing in-service piping includes, but is not limited to, provision and installation of the following: valves including tapping sleeves and valves, pipe supports for pipe remaining in place, pipe restraints, poured concrete thrust blocks if required, pipe caps, pipe blank or blind flanges, etc.; and, handling discharges from any and all waters from cut pipes.

6. Protection of finished and unfinished Work.

7. Protection of existing facilities remaining in-service.

8. Proper handling and disposal of all remaining contents in tankage scheduled for demolition including, but not limited to, equipment, instrumentation and piping internal to tanks, water, sediments, and media.

9. Repair and restoration of Work damaged during construction and/or demolition.

10. Furnishing as necessary proper equipment and machinery, of a sufficient capacity, to facilitate the Work and to handle all emergencies normally encountered in Work of this character.

11. Providing all compaction, dewatering, sheeting and shoring, turbidity control and monitoring, dust control, proper disposal including transport of all excess material resulting from demolition, proper recycling including transport of applicable material resulting from demolition, proper disposal of all excess material encountered including rock, backfill, and other substrate material not necessarily designated in the Contract Documents necessary to complete the Work.

12. Record Copy of Contract Documents: The CONTRACTOR shall keep one record copy of all Specifications, Drawings, Addenda, Change Orders, Supplemental Drawings, and Shop Drawings at the CONTRACTOR's office at the Site, in good order and annotated to show all changes made during the construction process in accordance with Section 01700 – Contract Closeout. The ENGINEER will inspect the record set of drawings and specifications on a monthly basis prior to preparation of the monthly progress payment; and in the event said drawings and specifications are not up-to-date, the monthly progress payment may be withheld until the record set of drawings and specifications are brought up-to-date. Such Documents shall be made available to the ENGINEER at all times and shall be delivered to the OWNER upon completion of the Work.

13. CONTRACTOR shall prepare and furnish detailed Record Survey drawings and other closeout documents upon the completion of the Work.

F. Implied and Normally Required Work: It is the intent of these Specifications to provide the OWNER with complete operable systems, subsystems and other items of Work. Any part or item of Work which is reasonably implied or normally required to make each installation satisfactorily and completely operable is deemed to be included in the Work and the Contract Amount. All miscellaneous appurtenances and other items of Work incidental to meeting the intent of these Specifications are included in the Work and the Contract Amount even though these appurtenances may not be specifically called for in these Specifications.

G. Quality of Work: Regard the apparent silence of the Contract Documents as to any detail, or the apparent omission from them of a detailed description concerning any Work to be done and materials to be furnished as meaning that only the best general practice is to prevail and that

only materials and workmanship of the best quality are to be used. Interpretation of these specifications will be made upon this basis.

H. CONTRACTOR to Verify: The CONTRACTOR shall verify all dimensions, quantities and details shown on the Drawings and Supplemental Drawings, equipment, material, finishes, and other such listings or other data received from the ENGINEER, and shall notify him of all errors, omissions, conflicts and discrepancies. This shall not relieve the CONTRACTOR of full responsibility for unsatisfactory Work, faulty construction, or improper operation resulting therefrom, or from rectifying such conditions at his own expense. He shall not be allowed to take advantage of any errors or omissions. All equipment, materials, finishes, and other such listings are given for the convenience of the ENGINEER and CONTRACTOR and are not guaranteed to be complete. The CONTRACTOR shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in Work to be done under the Contract.

I. For the work of this Contract, the word “construction” includes demolition, where applicable and specified. For example, “construction of the Work” includes demolition of select facilities as specified; “construction operations” includes demolition operations; and, “period of construction” includes period of work that involves demolition.

1.03 CONSTRAINTS

A. The Contract Documents are intended to allow the CONTRACTOR flexibility in construction of the Work; however, the following constraints apply:

1. At the WWE WTP location:

    a. Site access is restricted. CONTRACTOR shall coordinate access with OWNER. Except to gain access, the CONTRACTOR shall keep the gate to the site closed at all times including when CONTRACTOR is on site.

    b. In the area of demolition, potable water pipelines are in-service and pressurized. Any requested shut-down requires notice and coordination with OWNER as specified.

    c. Facilities to be protected include but are not limited to the above ground storage tank, high service pump building, electrical building and emergency generator.

2. At the FMB WWTP location:

    a. Site access is restricted. CONTRACTOR shall coordinate access with OWNER and sign-in at control room. Gate to site is closed at all times.

    b. In the area of demolition, potable water, reuse, influent, and effluent pipelines are in-service and pressurized, and sewer lines are in-service but not pressurized. Any requested shut-down requires notice and coordination with OWNER as specified.

    c. Sewer pipeline is in-service and disconnection of drain lines requires coordination with OWNER specified.

    d. Disconnections from sewer pipeline requires open cut of plant access drive and requires notice and coordination with OWNER as specified.

e. Influent (i.e. historical effluent) pipeline, consisting of 18-inch and 24-inch diameter piping, is in-service and disconnection of branches from this main line requires notification and coordination with OWNER as specified.

3. General:

a. Site access is restricted. CONTRACTOR shall coordinate access with OWNER. Except to gain access, the CONTRACTOR shall keep the gate to the site closed at all times including when CONTRACTOR is on site.

b. Blocking or closure of any plant access drives requires notice and coordination with OWNER.

c. Select pipelines in the area planned for demolition are in-service and may be pressurized. Work shall be performed to avoid or minimize shut-downs to the extent practicable. If required, requests for shut-downs shall be submitted to the OWNER for approval a minimum of two (2) weeks prior to anticipated shut-down. CONTRACTOR shall coordinate shut-downs with the OWNER and the CONTRACTOR shall notify the OWNER a minimum of 72-hours prior to the OWNER-approved shut-down.

4. Pre-Demolition Remediation

a. Contractor shall address all hazardous materials remediation, in accordance with these Specifications, prior to conducting any select demolition. Hazardous materials shall be properly removed and disposed of before any demolition work can be conducted.

1.04 OWNER OCCUPANCY

1. OWNER will occupy premises during entire period of construction in order to maintain normal operations. Cooperate with OWNER's representative(s) in all construction operations to minimize conflict, and to facilitate OWNER usage and operations.

2. Schedule the Work to accommodate OWNER occupancy.

3. Conduct operations so as to not inconvenience the general public.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Limit use of site and premises to allow:

1. OWNER occupancy and access to operate existing facilities.

2. Coordination of site use with OWNER.

B. Both plants, i.e. WWE WTP and FMB WWTP, have in-service facilities operated and maintained by the OWNER.

C. Unfavorable Construction or Demolition Conditions: During unfavorable weather, wet ground, or other unsuitable construction or demolition conditions, the CONTRACTOR shall confine his operations to Work which will not be affected adversely by such conditions. No portion of the Work shall be constructed or demolished under conditions which would adversely affect the quality or efficiency thereof, unless special means or precautions are taken by the CONTRACTOR to perform the Work in a proper and satisfactory manner. The CONTRACTOR shall, however, maintain suitable all-weather access to all portions of the Work Site.

D. Site Administration: The CONTRACTOR shall be responsible for all areas of the Site which he and his Subcontractors utilize in the performance of the Work. He will exert full control over the actions of all employees and other persons in the use and preservation of property and existing facilities except such controls as may be specifically reserved to the OWNER or others. The CONTRACTOR shall require all persons on the Site to observe the same regulations as he requires of his employees and representatives. The OWNER's employees, Authorized Representatives, Consultants, the ENGINEER.

1.06 LIMITS OF WORK AREA

A. Confine construction operations within the Contract Limits shown on the Drawings. Storage of equipment and materials, or erection and use of sheds outside of the Contract Limits, if such areas are the property of OWNER, shall be used only with OWNER's approval. Such storage or temporary structures, even within the Contract Limits, shall be confined to OWNER's property and shall not be placed on properties designated as easements or rights-of-way.

1.07 CONSTRUCTION PERMITS

A. CONTRACTOR shall obtain and pay for necessary construction permits, including those required for demolition, from those authorities or agencies having jurisdiction over land areas, utilities or structures which are located within the Contract Limits and which will be occupied, encountered, used, or temporarily interrupted by CONTRACTOR's operations.

B. When construction permits are accompanied by regulations or requirements issued by a particular authority or agency, it shall be CONTRACTOR's responsibility to familiarize himself and comply with such regulations or requirements as they apply to his operations on this project. Any costs associated with additional field supervision by authorities or agencies shall be the CONTRACTOR's responsibility.

1.08 WORK SEQUENCE

A. Construct Work in stages to accommodate OWNER's occupancy and use of premises during construction period and in accordance with the limitations on the sequence of construction specified. Coordinate construction schedules and operations with OWNER and ENGINEER.

B. Coordinate Work of all subcontractors.

C. CONTRACTOR must begin and complete Work within the first 60 days after Work has begun at that location.

1.09 INTENT OF CONTRACT DOCUMENTS

A. Contract Documents Complementary: All Work called for in the Contract Documents applicable to this Contract, but not shown in the Drawings in their present form, or shown in the Drawings and not specifically called for in the Specifications, shall be of like effect as if shown or mentioned in both. Work not specified in either the Drawings or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the Work, is required, and shall be performed by the CONTRACTOR as though it were specifically delineated or described.

B. Omission or Silence of Contract Documents: The apparent silence of the Contract Documents as to any detail, or the apparent omission from them of a detailed description concerning any Work to be performed or materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only materials and Workmanship of the best quality are to be used and interpretation of these Specifications shall be made upon that basis.

1.10 PIPING ALIGNMENT AND EQUIPMENT LOCATION VERIFICATIONS

A. The CONTRACTOR shall field verify the suitability of pipe alignments and equipment locations (e.g. insertion valves) with respect to the locations of existing facilities. These verifications shall be made on the submitted layout and shop drawings and before pipe and fittings are ordered from suppliers.

B. The CONTRACTOR shall be responsible to make minor adjustments of lengths or elevations in new construction necessary to suit existing facilities at no additional cost to the OWNER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

A. Starting Work: Start Work at WWE WTP and FMB WWTP in accordance with the Notice to Proceed and execute with such progress as may be required to prevent delay to other contractors or to the general completion of the project. Execute Work at such items and in or on such parts of the project, and with such forces, material and equipment, as to complete the Work in the time established by the Contract. At all times, schedule and direct the Work so that it provides an orderly progression to completion within the specified time for completion.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Explanation and Definitions

B. Measurement

C. Payment

D. Schedule of Values

E. Application for Payment

1.02 EXPLANATION AND DEFINITIONS

A. The following explanation of the Measurement and Payment for the bid/proposal form items is made for information and guidance. The omission of reference to any item in this description shall not, however, alter the intent of the bid/proposal form or relieve the CONTRACTOR of the necessity of furnishing such as a part of the Contract.

1.03 MEASUREMENT

A. The quantities set forth in the bid/proposal form are approximate and are given to establish a uniform basis for the comparison of bids. The OWNER reserves the right to increase or decrease the quantity of any class or portion of the work during the progress of construction in accord with the terms of the Contract.

1.04 PAYMENT

A. Payment shall be made for the items listed on the bid/proposal form on the basis of the work actually performed and completed, such work including but not limited to, the furnishing of all necessary labor, materials, equipment, transportation disposal of demolition debris, clean up, restoration of disturbed areas, and all other appurtenances to complete the construction and installation of the work as shown on the drawings and described in the specifications.

B. Unit prices are used as a means of computing the final figures for bid and Contract purposes, for periodic payments for work performed, for determining value of additions or deletions and wherever else reasonable.

1.05 SCHEDULE OF VALUES

A. Approval of Schedule: Submit for approval a preliminary schedule of values, in duplicate, for all of the Work. Prepare preliminary schedule in accordance with the General Conditions. Submit preliminary schedule of values within 10 calendar days after the Effective Date of the Agreement. Submit final schedule of values in accordance with the General Conditions.

B. Format: Utilize a format similar to the Table of Contents of the Project Specifications. Identify each line item with number and title of the major specification section. Identify site mobilization, bonds and insurance. Include within each line item, a direct proportional amount of CONTRACTOR'S overhead and profit.

C. Revisions: With each Application for Payment revise schedule to list approved Change Orders.

1.06 APPLICATION FOR PAYMENT

A. Required Copies: Submit three copies of each application on EJCDC Form No. 1910-8-E (1990) or approved equal. Present required information in typewritten form or on electronic media printout.

B. Execute certification by signature of authorized officer.

C. Use data from approved Schedule of Values.

D. Change Orders: List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of work.

E. Final Payment: Prepare Application for Final Payment as required in the General Conditions.

F. Submit an updated construction schedule with each Application for Payment.

G. Submit application for payment to ENGINEER on, or before, the 15th of each month.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

3.01 MEASUREMENT AND PAYMENT

A. Payment shall be made on the basis of work actually performed completing each item in the Bid, such work including, but not limited to, the furnishing of all necessary labor, materials, equipment, transportation and disposal of demolition debris, pre-demolition survey, cleanup, proper disposal or recycling, and all other appurtenances to complete the construction and/or demolition of the work to the configuration and extent as shown on the drawings and described in the specifications. Payment for each item includes compensation for cleanup and restorations. Cleanup and surface restorations (including pavement replacement) will be considered as ten percent (10%) of each pay item and complete payment will not be made until cleanup, restorations and as-builts are completed.

1. Mobilization/Demobilization WWE WTP Site: Payment for mobilization/demobilization WWE WTP Site will be made for at the Contract lump sum price subject to retainage as described in these Contract Documents. This item includes furnishing all labor, materials, equipment and services to perform those operations necessary for the movement of personnel, equipment, supplies and incidentals to and from the WWE WTP project site and for establishment of temporary offices, storage trailers, temporary power, buildings, safety equipment, sanitary facilities and first aid supplies as required by the specifications and state and local law and regulations at the WWE WTP project site. The cost of assistance to the ENGINEER shall also be included under this Contract Item. The costs of any other pre-construction or post-construction expense necessary to the start or completion of the work, excluding the cost of construction materials, shall also be included under this Contract Item. The cost of all other work as shown and specified that is not specifically included under other Contract Items shall also be included under this Contract Item.

2. Mobilization/Demobilization FMB WWTP Site: Payment for mobilization/demobilization FMB WWTP Site will be made for at the Contract lump sum price subject to retainage as described in these Contract Documents. This item includes furnishing all labor, materials, equipment and services to perform those operations necessary for the movement of personnel, equipment, supplies and incidentals to and from the FMB WWTP project site and for establishment of temporary offices, storage trailers, temporary power, buildings, safety equipment, sanitary facilities and first aid supplies as required by the specifications and state and local law and regulations at the FMB WWTP project site. The cost of assistance to the ENGINEER shall also be included under this Contract Item. The costs of any other pre-construction or post-construction expense necessary to the start or completion of the work, excluding the cost of construction materials, shall also be included under this Contract Item. The cost of all other work as shown and specified that is not specifically included under other Contract Items shall also be included under this Contract Item.

3. Furnish Bonds & Insurance: Payment will be made at the contract lump sum price bid for the Contractor to furnish Performance and Payment Bonds and Certificate of Insurance in accordance with the Contract Documents.

4. Furnish, Install & Maintain Erosion Control Measures: Payment will be made at the contract lump sum price bid for to furnish, install and maintain all erosion control measures related to the CONTRACTORS Work and as may be included in the Contract Documents for the duration of the CONTRACTORS Work, the project and any warranty periods included in the Contract Documents.

5. Demolition at WWE WTP Site: Payment for Construction and Demolition at WWE WTP Site will be made for at the Contract lump sum price subject to retainage as described in these Contract Documents. This item includes all Work required to complete the construction and demolition of select facilities specified at the WWE WTP location including, but not limited to, proper transport and disposal of wastes.

6. Demolition at FMB WWTP Site: Payment for Construction and Demolition at FMB WWTP Site will be made for at the Contract lump sum price subject to retainage as described in these Contract Documents. This item includes all Work required to complete the construction and demolition of select facilities specified at the FMB WWTP location including, but not limited to, proper transport and disposal of wastes.

7. Flowable Fill: Payment will be made at the contract unit price bid for each cubic yard of flowable fill delivered to site and placed in accordance with the Contract Documents.

    a. The use of flowable fill shall be directed by the OWNER or ENGINEER in advance.

    b. The Contract Unit Price bid shall include all delivery fee's and "short load" fee's. It is anticipated that if needed, flowable fill deliveries will be less than "full" truck-load quantities.

8. Furnish and Construction of Permanent Site Restoration: Payment will be made at the contract lump sum price bid for the CONTRACTOR to furnish and supply all labor, equipment and material needed to restore the site in accordance with the Contract Documents.

9. Furnish As-Built/As-Demolished Record Drawings and Surveyed Record Drawings: Payment will be made at the contract lump sum price bid for furnishing As-Built / As-Demolished Record Drawings and Digital Surveyed Record Drawings in accordance with the Contract Documents Section 01700 – Contract Closeout.

B. Retainage will be withheld from the final payment until written acceptance by the ENGINEER for all final clean up, restoration and Record Drawings/As-Builts. Retainage will not be paid out until all close-out paperwork and approvals have been finalized.

END OF SECTION

SECTION 01040

PROJECT MEETINGS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Coordination

B. Preconstruction Conference

C. Progress Meetings

1.02. COORDINATION

A. General: Coordinate scheduling, submittals, and Contract work to assure efficient and orderly sequence of installation/demolition of interdependent construction elements.

1.03. PRECONSTRUCTION CONFERENCE

A. General: Prior to commencement of the Work, in accordance with the General Conditions, the OWNER will conduct a preconstruction conference to be held at a predetermined time and place.

B. Delineation of Responsibilities: The purpose of the conference is to designate responsible personnel, to establish a working relationship among the parties and to identify the responsibilities of the OWNER, plant personnel and the CONTRACTOR. Matters requiring coordination will be discussed and procedures for handling such matters, established. The agenda will include:

1. Submittal procedures

2. Partial Payment procedures

3. Maintenance of Records

4. Schedules, sequences and maintenance of facility operations

5. Safety and First Aid responsibilities

6. Change Orders and Field Directive Changes

7. Use of site

8. Housekeeping

9. Equipment delivery

C. Attendees: The preconstruction conference is to be attended by the representatives of the CONTRACTOR, the OWNER, the ENGINEER and plant personnel that will be associated with the project. Representatives of regulatory agencies, subcontractors, and principal suppliers may also attend when appropriate.

D. Chair and Minutes: The preconstruction conference will be chaired by the OWNER who will also arrange for the keeping and distribution of minutes to all attendees.

1.04. PROGRESS MEETINGS

A. Meeting Frequency and Format: Schedule progress meetings on at least a bi-weekly basis or more frequently as warranted by the complexity of the Project, to review the Work, discuss changes in schedules, maintain coordination and resolve potential problems. Invite OWNER, ENGINEER and all subcontractor. Suppliers may be invited as appropriate. Minutes of the meeting will be maintained by CONTRACTOR and reviewed by ENGINEER prior to distribution by the CONTRACTOR. Distribute reviewed minutes to attendees within 7 calendar days after each meeting.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 01041

PROJECT COORDINATION

PART 1 GENERAL

1.01. SECTION INCLUDES

A. This Section specifies administrative and supervisory requirements necessary for project coordination including, but not necessarily limited to:

1. Coordination

2. Administrative and supervisory personnel

3. General provisions

4. Cleaning and protection

1.02. RELATED SECTIONS

A. Section 01040 – Project Meetings

1.03. COORDINATION

A. Coordination: Coordinate demolition activities included under various Sections of these Specifications to assure efficient and orderly completion of each part of the Work. Coordinate demolition operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

1. Where one part of the Work is dependent on other components, either before or after its own demolition, schedule demolition activities in the sequence required to obtain the best results.

2. Where availability of space is limited, coordinate demolition of different components to assure maximum accessibility for required maintenance, service and repair.

3. Make adequate provisions to accommodate items scheduled for later removal.

B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the OWNER and separate contractors where coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other demolition activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules

2. Installation and removal of temporary facilities

3. Delivery and processing of submittals

4. Progress meetings

5. Project Close-out activities

1.04. SUBMITTALS

A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the interrelationship of components shown on separate Shop Drawings.

2. Indicate required installation and demolition sequences.

3. Comply with requirements contained in Section 01300 – Submttals.

B. Staff Names: Within 15 days of Notice to Proceed, submit a list of the CONTRACTOR's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

3.01. GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer’s Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and movement.

E. Recheck measurements and dimensions, before starting each installation.

F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed demolition from incompatible material as necessary to prevent deterioration.

G. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed demolition for that purpose

3.02. CLEANING AND PROTECTION

A. During handling and installation, clean and protect demolition in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

B. Clean and maintain completed demolition as frequently as necessary through the remainder of the demolition period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: Supervise demolition activities to ensure that no part of the demolition completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the demolition period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading
2. Excessive internal or external pressures
3. Excessively high or low temperatures
4. Thermal shock
5. Excessively high or low humidity
6. Air contamination or pollution
7. Water or ice
8. Solvents
9. Chemicals
10. Light
11. Radiation
12. Puncture
13. Abrasion
14. Heavy traffic
15. Soiling, staining and corrosion
16. Bacteria
17. Rodent and inset infestation
18. Combustion
19. Electrical current
20. High speed operation
21. Improper lubrication
22. Unusual war or other misuse

23. Contact between incompatible materials

24. Destructive testing

25. Misalignment

26. Excessive weathering

27. Unprotected storage

28. Improper shipping or handling

29. Theft

30. Vandalism

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 GENERAL

1.01. SECTION INCLUDES

A. General Requirements

B. Scheduling of Shutdowns

1.02. RELATED SECTIONS

A. Section 01010 – Summary of Work

B. Section 02575 – Pavement Repair and Restoration

1.03. GENERAL REQUIREMENTS

A. CONTRACTOR shall be responsible for all cutting, fitting and patching, including attendant excavation and backfill, required to complete the work or to:

1. Make its several parts fit together properly.

2. Uncover portions of the work to provide for installation of ill-timed work.

3. Remove and replace defective work.

4. Remove and replace work not conforming to requirements of Contract Documents.

5. Remove samples of installed work as specified for testing.

6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

B. Coordination: Perform all cutting, fitting or patching of the Work that may be required to make the several parts thereof join in accordance with the Contract Documents. Perform restoration with competent workmen skilled in the trade.

C. Improperly Timed Work: Perform all cutting and patching required to install improperly timed work, to remove samples of installed materials for testing, and to provide for alteration of existing facilities or for the installation of new Work in the existing construction.

D. Limitations: Except when the cutting or removal of existing construction is specified or indicated, do not undertake any cutting or demolition which may affect the structural stability of the Work or existing facilities without the ENGINEER's concurrence

1.04. SUBMITTALS

A. Submit a written request to the ENGINEER well in advance of executing any cutting or alteration which affects:

1. Work of the OWNER or any separate contractors.

2. Structural value of integrity of any element of the project or work.

3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.

4. Efficiency, operational life, maintenance or safety of operational elements.

5. Visual qualities of sight-exposed elements.

B. Requests shall include:

1. Identification of the work.

2. Description of affected work.

3. The necessity for cutting, alteration or excavation.

4. Effect on work of OWNER or any separate contract, or on structural or weatherproof integrity of work.

5. Description of proposed work:

a. Scope of cutting, patching, alteration, or excavation.

b. Trades who will execute the work.

c. Products proposed to be used.

d. Extent of refinishing to be done.

6. Alternatives to cutting and patching.

7. Cost proposal, when applicable.

8. Written permission of any separate contractor whose work will be affected.

C. SUBMIT WRITTEN NOTICE TO THE ENGINEER DESIGNATING THE DATE AND THE TIME THE WORK WILL BE UNCOVERED.

1.05. SCHEDULING OF SHUTDOWN

A. Connections to Existing Facilities: If any connections, replacement, or other work requiring the shutdown of an existing facility is necessary, schedule such work at times when the impact on the OWNER's normal operation is minimal. Overtime, night and weekend work without additional compensation from the OWNER, may be required to make these connections, especially if the connections are made at times other than those specified.

B. Request for Shutdowns: Submit a written request for each shutdown to the OWNER and the ENGINEER sufficiently in advance of any required shutdown.

PART 2 PRODUCTS

2.01. MATERIALS

A. Comply with specifications and standards for each specific product involved.

PART 3 EXECUTION

3.01. INSPECTION

A. Inspect existing conditions of projects, including elements subject to damage or to movement during cutting and patching.

B. After uncovering work, inspect conditions affecting installation of products, or performance of the work.

C. Report unsatisfactory or questionable conditions to the ENGINEER in writing; do not proceed with work until the ENGINEER has provided further instructions.

3.02. PREPARATION

A. Provide adequate temporary support as necessary to assure structural value or integrity or affected portion of work.

B. Provide devices and methods to protect other portions of project from damage.

C. Provide protection from elements for that portion of the project which may be exposed by cutting and patching work, and maintain excavations free from water.

D. Material Removal: Cut and remove all materials to the extent shown or as required to complete the Work. Remove materials in a careful manner with no damage to adjacent facilities. Remove materials which are not salvageable from the site.

3.03. PERFORMANCE

A. Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.

B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.

C. Deploy original installer or fabricator to perform cutting and patching for:

1. Weather-exposed or moisture-resistant

2. Sight-exposed finished surfaces

D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.

E. Restore work which has been cut or removed; install new products to provide completed work in accord with requirements of contract documents.

F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes.

1. For continuous surfaces, refinish to nearest intersection.

2. For an assembly, refinish entire unit.

3.04. PAVEMENT RESTORATION

A. Restore all pavement or roadway surfaces in accordance with Section 02575 – Pavement Repair and Restoration.

B. The restoration of existing street paving, including underdrains, if any are encountered, where damaged, shall be restored by the CONTRACTOR and shall be replaced or rebuilt using the same type of construction as was in the original. The CONTRACTOR shall be responsible for restoring all such work, including subgrade, base courses, curb and gutter or other appurtenances where present. The CONTRACTOR shall obtain and pay for at his own expense such local or other governmental permits as may be necessary for the opening of streets and shall satisfy himself as to any requirements other than those herein set forth which may affect the type, quality and manner of carrying on the restoration of surfaces by reason of jurisdiction of such governmental bodies.

C. Pavement removed within the extents of demolition shall be replaced with backfill, as necessary, and surfaced with gravel. Pavement outside the limits of demolition that is damaged because of CONTRACTOR’s operations shall be repaired by the CONTRACTOR at no additional cost to the OWNER.

D. This section does not describe the construction of new road surfaces or the complete resurfacing of existing pavements.

E. In all cases, the CONTRACTOR will be required to maintain, without additional compensation, all permanent replacement of street paving, done by him under this Contract for a period of 12 months after the acceptance of the Contract, including the removal and replacement of such work wherever surface depressions or underlying cavities result from settlement of trench backfill.

F. The CONTRACTOR shall do all the final resurfacing or repaving of streets or roads, over the excavations that he has made and he shall be responsible for relaying paving surfaces of roads that have failed or been damaged, at any time before the termination of the maintenance period on account of work done by him and he shall resurface or repave over any tunnel jacking, or boring excavation that shall settle or break the surface, shall be repaved to the satisfaction of the OWNER and at the CONTRACTOR's sole expense. Backfilling of trenches and the preparation of subgrades shall conform to the requirements of excavation and backfilling of pipeline trenches.

END OF SECTION

SECTION 01051

LINES AND GRADES

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Overview

B. Surveys

C. Datum Plane

D. Protection of Survey Data

1.02. OVERVIEW

A. Construct all Work in accordance with the lines and grades shown on the Drawings. Assume full responsibility for keeping all alignment and grade.

1.03. SURVEYS

A. Reference Points: The OWNER will provide reference points for the Work as described in the General Conditions. Base horizontal and vertical control points will be designated by the ENGINEER and used as datum for the Work. Perform all additional survey, layout, and measurement work.

1. Keep ENGINEER informed, sufficiently in advance, of the times and places at which Work is to be performed so that base horizontal and vertical control points may be established and any checking deemed necessary by ENGINEER may be done, with minimum inconvenience to the ENGINEER and at no delay to CONTRACTOR. It is the intention not to impede the Work for the establishment of control points and the checking of lines and grades set by the CONTRACTOR. However, when necessary, suspend working operations for such reasonable time as the ENGINEER may require for this purpose. Costs associated with such suspension are deemed to be included in the Contract Price, and no time extension or additional costs will be allowed.

2. Provide an experienced survey crew including an instrument operator, competent assistants, and any instruments, tools, stakes, and other materials required to complete the survey, layout, and measurement of Work performed by the CONTRACTOR.

1.04. DATUM PLANE

A. Refer to Drawings.

1.05. PROTECTION OF SURVEY DATA

A. General: Safeguard all points, stakes, grade marks, known property corners, monuments, and bench marks made or established for the Work. Reestablish them if disturbed, and bear the entire expense of checking reestablished marks and rectifying work improperly installed.

B. Records: Keep neat and legible notes of measurements and calculations made in connection with the layout of the Work. Furnish copies of such data to the ENGINEER for use in checking the CONTRACTOR's layout. Data considered of value to the OWNER will be transmitted to the OWNER by the ENGINEER with other records on completion of the Work.

PART 2 PRODUCTS

NOT USED.

PART 3

NOT USED.

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Abbreviations and Symbols

B. Reference Standards

C. Definitions

1.02. RELATED SECTIONS

A. Information provided in this section is used where applicable in individual Specification Sections, Divisions 02 through 16.

1.03. REFERENCE ABBREVIATIONS

A. Reference to a technical society, trade association or standards setting organization, may be made in the Specifications by abbreviations in accordance with the following list:

AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
ADC	Air Diffusion Council
AFBMA	Anti-friction Bearing Manufacturers Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHA	Association of Home Appliance Manufacturers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association, Inc.
ANSI	American National Standards Institute
APA	American Plywood Association
ARI	American Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders' Hardware Manufacturers Association
BIA	Brick Institute of American
CABO	Council of American Building Officials
CAGI	Compressed Air and Gas Institute
CISPI	Cast Iron Soil Pipe Institute
CMAA	Crane Manufacturers Association of America
CRD	U.S. Corps of Engineers Specifications
CRSI	Concrete Reinforcing Steel Institute

CTI	Cooling Tower Institute
DHI	Door and Hardware Institute
DOH	Department of Health
DOT	Department of Transportation
Fed. Spec.	Federal Specifications
FGMA	Flat Glass Marketing Association
FM	Factory Mutual
HMI	Hoist Manufacturing Institute
HPMA	See HPVA
HPVA	Hardwood Plywood Veneer Association
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IFI	Industrial Fasteners Institute
MIL	Military Specifications
MSS	Manufacturer's Standardization Society
NAAMM	National Association of Architectural Metal Manufacturers
NACM	National Association of Chain Manufacturers
NBS	National Bureau of Standards, See NIST
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NETA	National Electrical Testing Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NFPA	National Fluid Power Association
NIST	National Institute of Standards and Technology
NLMA	National Lumber Manufacturers Association
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Act
PCI	Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
SAE	Society of Automotive Engineers
SCPRF	Structural Clay Products Research Foundation
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPI	Society of the Plastics Industry
SSPC	Steel Structures Painting Council
STI	Steel Tank Institute
TCA	Tile Council of American
TIMA	Thermal Insulation Manufacturers' Association
UL	Underwriters' Laboratories, Inc.
USBR	U.S. Bureau of Reclamation
USBS	U.S. Bureau of Standards, See NIST

1.04. REFERENCE STANDARDS

A. Latest Edition: Construe references to furnishing materials or testing, which conform to the standards of a particular technical society, organization, or body, to mean the latest standard, code, or specification of that body, adopted and published as of the date of bidding this Contract. Standards referred to herein are made a part of these Specifications to the extent which is indicated or intended.

B. Precedence: The duties and responsibilities of the OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees are set forth in the Contract Documents, and are not changed or altered by any provision of any referenced standard specifications, manuals or code, whether such standard manual or code is or is not specifically incorporated by reference in the Contract Documents. Any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority, to undertake responsibility

contrary to the powers of the ENGINEER as set forth in the Contract Documents cannot be assigned to the ENGINEER or any of the ENGINEER's consultants, agents or employees.

1.05. DEFINITIONS

A. In these Contract Documents the words furnish, install and provide are defined as follows:

1. Furnish (Materials): to supply and deliver to the project ready for installation and in operable condition.

2. Install (services or labor): to place in final position, complete, anchored, connected in operable condition.

3. Provide: to furnish and install complete. Includes the supply of specified services. When neither furnish, install or provide is stated, provided is implied.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 01092

ABBREVIATIONS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Abbreviations

B. Standards for Abbreviations

1.02. RELATED SECTIONS

A. Abbreviations provided in this section are used where applicable in individual Specification Sections, Divisions 2 through 16.

1.03. ABBREVIATIONS

A. Abbreviations which may be used in Divisions 01 through 16 for units of measure are as follows:

American wire gauge.....AWG
ampere(s) ..... amp
ampere-hour(s)..... AH
annual..... ann
Ampere Interrupting
Capacity..... AIC
atmosphere(s) ..... atm
average ..... avg

biochemical oxygen demand ..... BOD
Board Foot..... FBM
brake horsepower ..... bhp
Brinell Hardness ..... BH
British thermal unit(s).....Btu

calorie (s).....cal
carbonaceous biochemical
oxygen demand ..... CBOD
Celsius (centigrade)..... C
Center to Center ..... C to C
centimeter(s)..... cm
chemical oxygen demand ..... COD
coefficient, valve flow..... Cv
cubic ..... cu
cubic centimeter(s)..... cc
cubic feet per day..... cfd
cubic feet per hour ..... cfh
cubic feet per minute..... cfm
cubic feet per minute,
standard conditions ..... scfm
cubic feet per second..... cfs
cubic foot (feet) ..... cu ft
cubic inch(es)..... cu in
cubic yard(s) ..... cu yd

decibels..... dB
decibels (A scale)..... dBa
degree(s).....deg
dewpoint temperature .....dpt
diameter..... dia
direct current .....dc
dissolved oxygen..... DO
dissolved solids.....DS
dry-bulb temperature.....dbt

efficiency.....eff
elevation..... el
entering water temperature.....ewt
entering air temperature ..... eat
equivalent direct radiation..... edr

face area ..... fa
face to face..... f to f
Fahrenheit ..... F
feet per day..... fpd
feet per hour ..... fph
feet per minute..... fpm
feet per second..... fps
foot (feet) ..... ft
foot-candle..... fc
foot-pound ..... ft-lb
foot-pounds per minute..... ft-lb/min
foot-pounds per second .....ft-lb/sec
formazin turbidity unit(s) ..... FTU
frequency..... freq

gallon(s)..... gal
gallons per day ..... gpd
gallons per day per
cubic foot ..... gpd/cu ft

gallons per day per square foot..... gpd/sq ft
gallons per hour..... gph
gallons per minute ..... gpm
gallons per second ..... gps
gas chromatography and mass spectrometry ..... GC-MS
gauge ..... ga
grain(s) ..... gr
gram(s) ..... g
grams per cubic centimeter .....gm/cc

Heat Transfer Coefficient.....U
height..... hgt
Hertz..... Hz
horsepower..... hp
horsepower-hour .....hp-hr
hour(s) ..... hr
humidity, relative..... rh
hydrogen ion concentration .....pH

inch(es)..... in
inches per second .....ips
inside diameter .....ID

Jackson turbidity unit(s) ..... JTU

kelvin..... K
kiloamperes..... kA
kilogram(s) .....kg
kilometer(s) .....km
kilovar (kilovolt-amperes reactive) ..... kvar
kilovolt(s)..... kV
kilovolt-ampere(s)..... kVA
kilowatt(s).....kW
kilowatt-hour(s) .....kWh

linear foot (feet)..... lin ft
liter(s).....L

megavolt-ampere(s) .....MVA
meter(s).....m
micrograms per liter ..... ug/L
miles per hour .....mph
milliampere(s) ..... mA
milligram(s) ..... mg
milligrams per liter ..... mg/L
milliliter(s)..... mL
millimeter(s) ..... mm
million gallons ..... MG
million gallons per day..... mgd
millisecond(s) ..... ms
millivolt(s) ..... mV
minute(s) ..... min
mixed liquor suspended solids.....MLSS

nephelometric turbidity unit ..... NTU
net positive suction head.....NPSH
noise criteria.....nc
noise reduction coefficient.....NRC
number.....no

ounce(s) .....oz
outside air .....oa
outside diameter ..... OD

parts per billion..... ppb
parts per million..... ppm
percent ..... pct
phase (electrical) .... ph
pound(s) ..... lb
pounds per cubic foot ..... pcf
pounds per cubic foot per hour ..... pcf/hr
pounds per day.....lbs/day
pounds per day per cubic foot ..... lbs/day/cu ft
pounds per day per square foot..... lbs/day/sq ft
pounds per square foot..... psf
pounds per square foot per hour ..... psf/hr
pounds per square inch ..... psi
pounds per square inch absolute.....psia
pounds per square inch gauge .....psig
power factor.....PF
pressure drop or difference..... dp
pressure, dynamic (velocity) ..... vp
pressure, vapor..... vap pr

quart(s) ..... qt

Rankine ..... R
relative humidity..... rh
resistance ..... res
return air ..... ra
revolution(s)..... rev
revolutions per minute ..... rpm
revolutions per second..... rps
root mean squared..... rms

safety factor ..... sf
second(s)..... sec
shading coefficient..... SC
sludge density index ..... SDI
Sound Transmission Coefficient..... STC
specific gravity ..... sp gr
specific volume..... Sp Vol

sp ht at constant pressure ..... Cp
square ..... sq
square centimeter(s).....sq cm
square foot (feet)..... sq ft
square inch (es) ..... sq in
square meter(s)..... sq m
square yard(s)..... sq yd
standard..... std
static pressure.....st pr
supply air..... . . sa
suspended solids ..... SS

temperature..... temp
temperature difference ..... TD
temperature entering..... TE
temperature leaving ..... TL
thousand Btu per hour..... Mbh
thousand circular mils ..... kcmil
thousand cubic feet ..... Mcf
threshold limit value ..... TLV
tons of refrigeration ..... tons
torque..... TRQ
total dissolved solids ..... TDS
total dynamic head..... TDH
total kjeldahl nitrogen ..... TKN
total oxygen demand..... TOD
total pressure ..... TP
total solids ..... TS
total suspended solids..... TSS
total volatile solids..... TVS

vacuum ..... vac
viscosity ..... visc
volatile organic chemical ..... VOC
volatile solids.....VS
volatile suspended solids ..... VSS
volt(s) V
volts-ampere(s) ..... VA
volume ..... vol

watt(s) ..... W
watthour(s) ..... Wh
watt-hour demand .....WHD
watt-hour demand meter .....WHDM
week(s) ..... wk
weight ..... wt
wet-bulb ..... WB
wet bulb temperature ..... WBT

yard(s).....yd
year(s).....yr

1.04. STANDARD FOR ABBREVIATIONS

A. Use ASME Y1.1-1989, “Abbreviations for use on Drawings and in Text” for abbreviations for units of measure not included in Article 1.03.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Description of Requirements

B. Submittal Procedures

C. Specific Submittal Requirements

D. Action on Submittals

E. Repetitive Review

1.02. RELATED SECTIONS

A. 01700 – Contract Closeout

1.03. DESCRIPTION OF REQUIREMENTS

A. This section specifies procedural requirements for Shop Drawings, product data, samples, and other miscellaneous Work-related submittals.

B. Procedures concerning items such as listing of manufacturers, suppliers, subcontractors, construction progress schedule, schedule of Shop Drawing submissions, bonds, payment applications, insurance certificates, and schedule of values are specified elsewhere.

C. Work Related Submittals:

1. Substitution of “OR Equal” Items:

a. Includes material or equipment CONTRACTOR requests ENGINEER to accept, after Bids are received, as substitute for items specified or described in Specifications by using name of a proprietary item or name of particular supplier.

2. Shop Drawings:

a. Includes technical data and drawings specially prepared for this Project, including fabrication and installation drawings, diagrams, data sheets, schedules, templates, patterns, reports, instructions, design mix formulas, measurements, and similar information not in standard printed form.

b. Standard information prepared without specific reference to the Project is not considered a Shop Drawing.

3. Product Data:

a. Includes standard printed information on manufactured products, and systems that has not been specially prepared for this Project, including manufacturer's product specifications and installation instructions, catalog cuts, mill reports, and standard color charts.

4. Samples:

   a. Includes both fabricated and manufactured physical examples of materials, products, and units of work, partial cuts of manufactured or fabricated work, swatches showing color, texture, and pattern, and units of work to be used for independent inspection and testing.

   b. Mock-ups are special forms of samples, which are too large or otherwise inconvenient for handling in manner specified for transmittal of sample submittals.

5. Working Drawings:

   a. When used in the Contract Documents, the term “working drawings” shall be considered to mean the CONTRACTOR’S plans for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities control systems, forming and falsework for underpinning; temporary by-pass pumping and for such other work as may be required for construction but does not become an integral part of the project.

   b. Copies of working drawings shall be submitted to the ENGINEER at least fourteen (14) calendar days (unless otherwise specified by the ENGINEER) in advance of the required work.

   c. Working drawings shall be signed by a registered Professional Engineer currently licensed to practice in the State of Florida and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use.

6. Miscellaneous Submittals:

   a. Work-related submittals that do not fit in the previous categories, such as guarantees, warranties, certifications, experience records, maintenance agreements, Operating and Maintenance Manuals, workmanship bonds, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, and similar information, devices, and materials applicable to the Work.

1.04. SUBMITTAL PROCEDURES

A. Scheduling:

   1. Submit for approval, a preliminary schedule of shop drawings and samples submittals, in duplicate, and in accordance with the General Conditions.

   2. Prepare and transmit each submittal to ENGINEER sufficiently in advance of scheduled performance of related work and other applicable activities.

B. Coordination:

   1. Coordinate preparation and processing of submittals with performance of work. Coordinate each submittal with other submittals and related activities such as substitution requests, testing, purchasing, fabrication, delivery, and similar activities that require sequential activity.

   2. Coordinate submission of different units of interrelated work so that one submittal will not be delayed by ENGINEER's need to review a related submittal. ENGINEER may

withhold action on any submittal requiring coordination with other submittals until related submittals are forthcoming.

C. Submittal Preparation

1. Stamp and sign each submittal certifying review of submittal, verification of products, field measurement, field construction criteria, coordination of information within submittal with requirements of the Work and the Contract Documents, coordination with all trades, and verification that product will fit in space provided.

2. Transmittal Form: In the transmittal form forwarding each specific submittal to the ENGINEER include the following information as a minimum.

a. Date of submittal and dates of previous submittals containing the same material.

b. Project title and number.

c. Submittal and transmittal number.

d. Contract identification.

e. Names of:

1) Contractor

2) Supplier

3) Manufacturer

f. Identification of equipment and material with equipment identification numbers, model numbers, and Specification Section number.

g. Variations from Contract Documents and any limitations, which may affect the Work.

h. Drawing sheet and detail number as appropriate.

D. Resubmittal Preparation:

1. Comply with the requirements described in Submittal Preparation. In addition:

a. Identify on transmittal form that submittal is a resubmission.

b. Make any corrections or changes in submittals required by ENGINEER’s notations on returned submittal.

c. Respond to ENGINEER’s notations:

1) On the transmittal or on a separate page attached to CONTRACTOR's resubmission transmittal, answer or acknowledge in writing all notations or questions indicated by ENGINEER on ENGINEER's transmittal form returning review submission to CONTRACTOR.

2) Identify each response by question or notation number established by ENGINEER.

3) If CONTRACTOR does not respond to each notation or question, resubmission will be returned without action by ENGINEER until CONTRACTOR provides a written response to all ENGINEER's notations or questions.

d. CONTRACTOR initiated revisions or variations:

1) On transmittal form identify variations or revisions from previously reviewed submittal, other than those called for by ENGINEER.

2) ENGINEER’s responsibility for variations or revisions is established in the General Conditions.

1.05. SPECIFIC SUBMITTAL REQUIREMENTS

A. Specific submittals required for individual elements of work are specified in the individual Specification sections. Except as otherwise indicated in Specification sections, comply with requirements specified herein for each indicated type of submittal.

B. Requests for Substitution or “OR Equal”

1. Collect data for items to be submitted for review as substitution into one submittal for each item of material or equipment in accordance with the General Conditions.

2. Submit with other scheduled submittals for the material or equipment allowing time for ENGINEER to evaluate the additional information required to be submitted.

3. If CONTRACTOR requests to substitute for material or equipment specified but not identified in Specifications as requiring submittals, schedule substitution submittal request in Submittal schedule and submit as scheduled.

C. Shop Drawings:

1. Check all drawings, data and samples before submitting to the ENGINEER for review. Each and every copy of the drawings and data shall bear CONTRACTOR’s stamp showing that they have been so checked. Shop drawings submitted to the ENGINEER without the CONTRACTOR’s stamp will be returned to the CONTRACTOR for conformance with this requirement. All shop drawings shall be submitted through the CONTRACTOR, including those from any subcontractors.

2. Submit newly prepared information, with graphic information at accurate scale. Indicate name of manufacturer or supplier (firm name). Show dimensions and clearly note which are based on field measurement; identify materials and products which are included in the Work; identify revisions. Indicate compliance with standards and notation of coordination requirements with other work. Highlight, encircle or otherwise indicate variations from Contract Documents or previous submittals.

3. Include on each drawing or page:

a. Submittal date and revision dates.

b. Project name, division number and descriptions.

c. Detailed specifications section number and page number.

d. Identification of equipment, product or material.

e. Name of CONTRACTOR and subcontractor.

f. Name of supplier and manufacturer.

g. Relation to adjacent structure or material.

h. Field dimensions, clearly identified.

i. Standards or Industry Specification references.

j. Identification of deviations from the Contract Documents.

k. CONTRACTOR's stamp, initialed or signed, dated and certifying the review of submittal, certification of field measurements and compliance with Contract.

l. Physical location and location relative to other connected or attached material at which the equipment or materials are to be installed.

4. Submittals:

a. Submit as electronic files to ENGINEER.

5. Distribution:

a. Do not proceed with installation of materials, products or systems until copy of applicable product data showing only approved information is in possession of installer.

b. Maintain access to product data (for each submittal) at Project site either electronically or as hard copy.

D. Product Data:

1. Preparation:

a. Collect required data into single submittal for each element of work or system. Where product data has been printed to include information on several similar products, some of which are not required for use on Project or are not included in submittal, mark copies to clearly show such information is not applicable.

b. Where product data must be specially prepared for required products, materials or systems, because standard printed data are not suitable for use, submit data as a Shop Drawing and not as product data.

2. Submittals:

a. Submittal is for information and record, and to determine that products, materials, and systems comply with Contract Documents. Submittal is final when returned by ENGINEER marked "Approved" or "Approved as Noted".

b. Submit as electronic files to ENGINEER.

3. Distribution:

a. Do not proceed with installation of materials, products or systems until copy of applicable product data showing only approval information is in possession of installer.

b. Maintain access to product data (for each submittal) at Project site either electronically or as hard copy.

E. Miscellaneous Submittals:

1. Inspection and Test Reports:

a. Classify each inspection and test report as being either "Shop Drawings" or "product data", depending on whether report is specially prepared for Project or standard publication of workmanship control testing at point of production. Process inspection and test reports accordingly.

2. Guarantees, Warranties, Maintenance Agreements, and Workmanship Bonds:

a. Refer to Specification sections for specific requirements. Submittal is final when returned by ENGINEER marked "Approved" or "Approved as Noted".

3. Survey Data:

a. Refer to Specification sections for specific requirements on property surveys, building or structure condition surveys, field measurements, quantitative records of actual Work, damage surveys, photographs, and similar data required by Specification sections.

1) Survey Copies: Provide as electronic file to ENGINEER.

2) Condition Surveys: Provide as electronic file to ENGINEER.

4. Certifications:

a. Refer to Specification sections for specific requirement on submittal of certifications. Submit electronically. Certifications are submitted for review of conformance with specified requirements and information. Submittal is final when returned by ENGINEER marked "Approved".

5. Closeout Submittals:

a. Refer to Specification Section 01700 – Contract Closeout for specific requirements on submittal of closeout information, materials, tools, and similar items.

1) Record Documents: See Section 01700 – Contract Closeout

2) Materials and Tools: Spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar physical units to be submitted.

3) Operating and maintenance data.

F. Operation and Maintenance Manuals:

1. Submit Operation and Maintenance Manuals in accordance with Section 01700 – Contract Closeout.

G. General Distribution:

1. Unless required elsewhere, provide distribution of submittals to subcontractors, suppliers, governing authorities, and others as necessary for proper performance of work.

1.06. ACTION ON SUBMITTALS

A. ENGINEER’s Action:

1. General:

a. Except for submittals for record and similar purposes, where action and return on submittals are required or requested, ENGINEER will review each submittal, mark with appropriate action, and return. Where submittal must be held for coordination, ENGINEER will also advise CONTRACTOR without delay.

b. ENGINEER will stamp each submittal with uniform, self-explanatory action stamp, appropriately marked with submittal action.

B. Action Stamp:

1. Approved:

a. Final Unrestricted Release: Where submittals are marked "Approved", Work covered by submittal may proceed PROVIDED IT COMPLIES WITH CONTRACT DOCUMENTS. Acceptance of Work will depend upon that compliance.

2. Approved As Noted:

a. When submittals are marked "Approved as Noted", Work covered by submittal may proceed PROVIDED IT COMPLIES WITH BOTH ENGINEER'S NOTATIONS OR CORRECTIONS ON SUBMITTAL AND WITH Contract Documents. Acceptance of Work will depend on that compliance. Re-submittal is not required.

3. Comments Attached – Confirm or Resubmit

a. When submittals are marked "Examined and Returned for Correction", do not proceed with Work covered by submittal. Do not permit Work covered by submittal to be used at Project site or elsewhere where Work is in progress.

b. Revise submittal or prepare new submittal in accordance with ENGINEER's notations in accordance with Article 1.04.D of this Section. Resubmit submittal without delay. Repeat if necessary to obtain different action marking.

1.07. RE-SUBMITTAL REVIEW

A. Cost of Subsequent Reviews: Shop Drawings and Operation and Maintenance Manuals submitted for each item will be reviewed no more than twice at the OWNER's expense. All subsequent reviews will be performed at times convenient to the ENGINEER and at the CONTRACTOR's expense based on the ENGINEER's then prevailing rates including all direct and indirect costs and fees. Reimburse the OWNER for all such fees invoiced to the OWNER by the ENGINEER.

B. Time Extension: Any need for more than one resubmission, or any other delay in ENGINEER's review of submittals, will not entitle CONTRACTOR to extension of the Contract Time.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01310

PROGRESS SCHEDULE

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Form of Schedules

B. Content of Schedules: Submit for approval, a preliminary progress schedule in accordance with the General Conditions.

C. Schedule Revisions

D. Submittal Requirements

1.02. FORM OF SCHEDULES

A. Prepare schedules in form of a horizontal bar chart.

1. Provide separate horizontal bar for each trade or operation.

2. Utilize a horizontal time scale and identify first workday of each week.

3. Utilize scale and spacing to allow space for notations and future revisions.

B. Utilize a listing format, which chronologically indicates the order of start of each item of work.

C. Identify each listing by major specification section numbers.

1.03. CONTENT OF SCHEDULES

A. Completion Dates: Show the beginning and ending contract dates stated in documents. Schedules showing completion prior to the contract completion date will be accepted but in no event will they be considered basis for a claim for delay against the OWNER by the CONTRACTOR for the period between the early completion date and the completion date provided in the Contract Documents

B. Show complete sequence of construction by activity.

C. Show dates for beginning and completion of each major element of construction and installation dates for major items of equipment. Elements shall include, but not be limited to, the following:

1. Shop drawing receipt from supplier/manufacturer submitted to ENGINEER, review and return to supplier/manufacturer

2. Material and equipment order, manufacturer, delivery, installation, and checkouts

3. Performance tests and supervisory services activity

4. Construction of various facilities

5. Demolition

6. Excavation, sheeting, shoring, dewatering

7. Concrete placement sequence

8. Piping and equipment installation

9. Electrical work activity

10. Connection to existing sewers

11. Miscellaneous concrete placement

12. Subcontractor's items of work

13. Backfilling, grading, seeding, sodding, landscaping, fence construction, and paving

14. Final cleanup

15. Allowance for inclement weather

16. Coordination with concurrent Work on site

D. Show projected percentage of completion for each item as of first day of each month.

1.04. SCHEDULE REVISIONS

A. As a minimum, revise construction schedule every 15 calendar days to reflect changes in progress of Work for duration of Contract

B. Indicate progress of each activity at date of submittal.

C. Show changes occurring since previous submittal of schedule

1. Major change in scope

2. Activities modified since previous submittal

3. Revised projections of progress and completion

4. Other identifiable changes

D. Provide a written report as needed to define:

1. Problem areas, anticipated delays, and impact on schedule

2. Corrective action recommended and its effect

3. Effect of changes on schedules of other Contractors

1.05. SUBMITTAL REQUIREMENTS

A. Schedule: Submit final progress schedule in accordance with the General Conditions.

B. For preliminary and final submittal of construction progress schedule and subsequent revisions thereof furnish three copies to ENGINEER.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01381

AUDIO VIDEO DOCUMENTATION

PART 1 GENERAL

1.01. SUMMARY OF WORK

A. The CONTRACTOR shall provide the services of an Audio Video firm to furnish color audio videotaping of jobsite, and all right of ways prior to starting any construction activity.

1. Taping shall be conducted by a professional audio video firm knowledgeable in the construction practices and experienced in the implementation of established inspection procedures.

2. Audio videotaping must be completed and accepted by ENGINEER prior to demolition.

B. Quality Assurance:

1. All audio videotaping shall be conducted by an independent third party and professional video company knowledgeable in the construction practices and experienced in the implementation of established inspection procedures.

C. Videographer to supply:

1. All labor, materials and equipment to perform these services.

2. Professional quality video on DVD format

3. Written documentation indicating areas covered on tape

D. Equipment:

1. Only broadcast quality camera capable of producing a resolution of NTSC 500 horizontal lines or better shall be used.

2. Recorders must be of professional or industrial grade only, as specified by the National Standard code.

3. Audio video cassettes must be of professional grade standard DVD. No used disks or “seconds” shall be allowed.

4. The ENGINEER reserves the right to request sample work and investigate the qualifications of any firm chosen to perform this Work. Proof of coverage by Workman’s Compensation insurance must also be provided.

1.02. SUBMITTALS

A. Name and address of the audio video taping firm to be used.

B. Copy of sample tape.

C. Manufacturer of video tapes to be used.

D. Letters of reference.

PART 2 PRODUCTS

2.01. AUDIO AND VIDEO

A. Each tape must begin with OWNER's name, CONTRACTOR's name, contract name and number, date and location information.

B. Video portion of DVD shall contain electronically superimposed details of: year, month, day, time (24 hour clock), route, station numbers and direction of travel shall also be electronically superimposed imposed in upper portion of screen area.

C. All information appearing on the tape must be continuous and run simultaneously by computer generated transparent digital information. No editing or overlaying of this information at a later date will be accepted.

D. Written documentation must coincide with the information on the tape so as to make easy retrieval of locations sought at a later date.

E. Audio shall be recorded at the same time as the video recording and shall have the same information as on the viewing screen. Special commentary will be given for unusual conditions of buildings, foundations, sidewalks, curbing, trees, etc.

F. All tapes and boxes shall bear labels with the following information:

1. DVD number

2. OWNER's name

3. Date of taping

4. Project name and number

5. Location and stationing limit of tape

PART 3 EXECUTION

3.01. GENERAL

A. All filming shall be performed during regular business hours, unless otherwise approved by the ENGINEER.

B. Three (3) copies [original plus two (2) copies]; one for CONTRACTOR, one for ENGINEER and one for OWNER.

C. All DVD's must be turned in within five (5) days, complete with written documentation accompanying tapes with appropriate retrieval information.

D. Any damage and/or claims not indicated on pre-construction video shall be considered the result of the construction and become the responsibility of the CONTRACTOR.

E. The ENGINEER reserves the right to reject audio-video taping because of poor quality, unintelligible audio, uncontrolled pan and zoom.

F. Re-taping and extra taping shall be done with the direction of the ENGINEER.

1. Any right-of-ways are to be surveyed and marked with proper survey markings according to the contract drawings prior to videotaping unless otherwise directed by the ENGINEER.

2. No taping shall be conducted during unacceptable weather conditions.

3. The CONTRACTOR shall supply a continuous pre-demolition audio video tape recording along entire routes of proposed pipelines and/or work areas.

4. Coverage includes, but not limited to, all existing roadways and streets, sidewalks, curbing, driveways, structures, buildings, headwalls, retaining walls, culverts, ditches (to show drainage patterns), catch basins, landscaping, trees, shrubs, visible utilities, signing monumentation and building exteriors located within the zone of influence. Houses and buildings shall be identified both audibly and visibly when possible.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Submittals

B. Inspection Services

C. Inspection of Materials

D. Quality Control

E. Costs of Inspection

F. Acceptance Tests

G. Failure to Comply with Contract

1.02. RELATED SECTIONS

A. Section 01300 - Submittals

1.03. SUBMITTALS

A. General: Provide all submittals, including the following, as specified in Division 01.

B. Certificate Submittals: Furnish the ENGINEER authoritative evidence in the form of Certificates of Manufacture that the materials and equipment to be used in the Work have been manufactured and tested in conformity with the Contract Documents. Include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

1.04. INSPECTION SERVICES

A. OWNER’s Access: At all times during the progress of the Work and until the date of final completion, afford the OWNER and ENGINEER every reasonable, safe, and proper facility for inspecting the Work at the site. The observation and inspection of any work will not relieve the CONTRACTOR of any obligations to perform proper and satisfactory work as specified. Replace work rejected due to faulty design, inferior, or defective materials, poor workmanship, improper installation, excessive wear, or nonconformity with the requirements of the Contract Documents, with satisfactory work at no additional cost to the OWNER. Replace as directed, finished or unfinished work found not to be in strict accordance with the Contract, even though such work may have been previously approved and payment made therefor.

B. Rejection: The OWNER and the OWNER's Authorized Representatives have the right to reject materials and workmanship, which are defective or require correction. Promptly remove rejected work and materials from the site.

C. Inferior Work Discoveries: Failure or neglect on the part of the OWNER or the OWNER's Authorized Representatives to condemn or reject bad or inferior work or materials does not imply an acceptance of such work or materials. Neither is it to be construed as barring the OWNER or the OWNER's Authorized Representatives at any subsequent time from

recovering damages or a sum of money needed to build anew all portions of the Work in which inferior work or improper materials were used.

D. Removal for Examination: Should it be considered necessary or advisable by the OWNER or the OWNER's Authorized Representatives, at any time before final acceptance of the Work, to make examinations of portions of the Work already completed, by removing or tearing out such portions, promptly furnish all necessary facilities, labor, and material, to make such an examination. If such Work is found to be defective in any respect, defray all expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the cost of examination and restoration of the Work will be considered a change in the Work to be paid for in accordance with applicable provisions of the Contract.

E. Operation Responsibility: Assume full responsibility for the proper operation of equipment during tests and instruction periods. Make no claim for damage which may occur to equipment prior to the time when the OWNER accepts the Work.

F. Rejection Prior to Warranty Expiration: If at anytime prior to the expiration of any applicable warranties or guarantees, equipment is rejected by the OWNER, repay to the OWNER all sums of money received for the rejected equipment on progress certificates or otherwise on account of the Contract lump sum prices, and upon the receipt of the sum of money, OWNER will execute and deliver a bill of sale of all its rights, title, and interest in and to the rejected equipment. Do not remove the equipment from the premises of the OWNER until the OWNER obtains from other sources, equipment to take the place of that rejected. The OWNER hereby agrees to obtain other equipment within a reasonable time and the CONTRACTOR agrees that the OWNER may use the equipment furnished by the CONTRACTOR without rental or other charge until the other new equipment is obtained.

1.05. INSPECTION OF MATERIALS

A. Remanufacture Notification: Give notice in writing to the ENGINEER sufficiently in advance of the commencement of manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. When required, notice to include a request for inspection, the date of commencement, and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, ENGINEER will arrange to have a representative present at such times during the manufacture or testing as may be necessary to inspect the materials, or will notify CONTRACTOR that the inspection will be made at a point other than the point of manufacture or testing, or that the inspection will be waived. Comply with these provisions before shipping any materials. Such inspection will not constitute a release from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

1.06. QUALITY CONTROL

A. Testing

1. Field and Laboratory

a. Provide personnel to assist the ENGINEER in performing the following periodic observation and associated services.

1) Soils: Observe and test excavations, placement and compaction of soils. Determine suitability of excavated material. Observe subgrade soils and foundations.

2) Concrete: Observe forms and reinforcement; observe concrete placement; witness air entrainment tests, facilitate concrete cylinder preparation and assist with other tests performed by ENGINEER.

b. When specified in Divisions 02 through 16 of the Contract Documents, provide an independent laboratory testing facility to perform required testing. Qualify the laboratory as having performed previous satisfactory work. Prior to use, submit to the ENGINEER for approval.

c. Cooperate with the ENGINEER and laboratory testing representatives. Provide at least a 24 hour notice prior to when specified testing is required. Provide labor and materials, and necessary facilities at the site as required by the ENGINEER and the testing laboratory.

d. Provide an independent testing agency, a member of the National Electrical Testing Association, to perform inspections and tests specified in Division 16 of these Specifications.

2. Equipment: Coordinate and demonstrate test procedures as specified in the Contract Documents or as otherwise required during the formal tests.

3. Pipeline and Other Testing: Conform to test procedures and requirements specified in the appropriate Specification Section.

B. Reports

1. Certified Test Reports: Where transcripts or certified test reports are required by the Contract Documents, meet the following requirements:

a. Before delivery of materials or equipment submit and obtain approval of the ENGINEER for all required transcripts, certified test reports, certified copies of the reports of all tests required in referenced specifications or specified in the Contract Documents. Perform all testing in an approved independent laboratory or the manufacturer's laboratory. Submit for approval reports of shop equipment tests within thirty days of testing. Transcripts or test reports are to be accompanied by a notarized certificate in the form of a letter from the manufacturer or supplier certifying that tested material or equipment meets the specified requirements and the same type, quality, manufacture and make as specified. The certificate shall be signed by an officer of the manufacturer or the manufacturer's plant manager.

2. Certificate of Compliance: At the option of the ENGINEER, or where not otherwise specified, submit for approval a notarized Certificate of Compliance. The Certificates may be in the form of a letter stating the following:

3. Manufacturer has performed all required tests

C. Materials to be supplied meet all test requirements

D. Tests were performed not more than one year prior to submittal of the certificate

E. Materials and equipment subjected to the tests are of the same quality, manufacture and make as those specified

F. Identification of the materials

1.07. COSTS OF INSPECTION

A. OWNER’s Obligation: Initial inspection and testing of materials furnished under this Contract will be performed by the OWNER or his authorized Representatives or inspection bureaus without cost to the CONTRACTOR, unless otherwise expressly specified. If subsequent

testing is necessary due to failure of the initial tests or because of rejection for noncompliance, reimburse the OWNER for expenditures incurred in making such tests.

B. CONTRACTOR's Obligation: Include in the Contract Price, the cost of all shop and field tests of equipment and other tests specifically called for in the Contract Documents.

C. Reimbursements to OWNER:

1. Materials and equipment submitted by the CONTRACTOR as the equivalent to those specifically named in the Contract may be tested by the OWNER for compliance. Reimburse the OWNER for expenditures incurred in making such tests on materials and equipment which are rejected for noncompliance.

2. Reimburse OWNER for the costs of any jobsite inspection between the hours of 7:00 p.m. and 6:00 a.m.

3. Reimburse OWNER for all costs associated with Witness Tests which exceed 5 Calendar Days per kind of equipment.

1.08. ACCEPTABLE TESTS

A. Preliminary Field Tests: As soon as conditions permit, furnish all labor and materials and services to perform preliminary field tests of all equipment provided under this Contract. If the preliminary field tests disclose that any equipment furnished and installed under this Contract does not meet the requirements of the Contract Documents, make all changes, adjustments and replacements required prior to the acceptance tests.

B. Final Field Tests: Upon completion of the Work and prior to final payment, subject all equipment, piping and appliances installed under this Contract to specified acceptance tests to demonstrate compliance with the Contract Documents.

1. Furnish all labor, fuel, energy, water and other materials, equipment, instruments and services necessary for all acceptance tests.

2. Conduct field tests in the presence of the ENGINEER. Perform the field tests to demonstrate that under all conditions of operation each equipment item:

a. Has not been damaged by transportation of installation

b. Has been properly installed

c. Has been properly lubricated

d. Has no mechanical defects

e. Is in proper alignment

f. Has been properly connected

g. Operates as intended

C. Failure of Tests: If the acceptance tests reveal defects in material or equipment, or if the material or equipment in any way fails to comply with the requirements of the Contract Documents, then promptly correct such deficiencies. Failure or refusal to correct the deficiencies, or if the improved materials or equipment, when tested again, fail to meet the guarantees or specified requirements, the OWNER, notwithstanding its partial payment for work and materials or equipment, may reject said materials or equipment and may order the

CONTRACTOR to remove the defective work from the site at no addition to the Contract Price, and replace it with material or equipment which meets the Contract Documents.

1.09. FAILURE TO COMPLY WITH CONTRACT

A. Unacceptable Materials: If it is ascertained by testing or inspection that the material or equipment does not comply with the Contract, do not deliver said material or equipment, or if delivered remove it promptly from the site or from the Work and replace it with acceptable material without additional cost to the OWNER. Fulfill all obligations under the terms and conditions of the Contract even though the OWNER or the OWNER's Authorized Representatives fail to ascertain noncompliance or notify the CONTRACTOR of noncompliance.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. General Requirements

B. Temporary Utilities

C. Temporary Construction

D. Barricades and Enclosures

E. Fences

F. Security

G. Temporary Controls

H. Traffic Regulation

I. Field Offices and Sheds

1.02. GENERAL REQUIREMENTS

A. Plant and Facilities: Furnish, install, maintain and remove all false work, scaffolding, ladders, hoistways, braces, pumping plants, shields, trestles, roadways, sheeting, centering forms, barricades, drains, flumes, and the like, any of which may be needed in the construction of any part of the Work and which are not herein described or specified in detail. The CONTRACTOR shall accept responsibility for the safety and efficiency of such works and for any damage that may result from their failure or from their improper construction, maintenance or operation.

B. First Aid: Maintain a readily accessible, completely equipped first aid kit at each location where work is in progress.

C. Safety Responsibility: Accept sole responsibility for safety and security at the site. Indemnify and hold harmless the OWNER and the OWNER's Authorized Representatives, including the ENGINEER, for any safety violation, or noncompliance with governing bodies and their regulations, and for accidents, deaths, injuries, or damage at the site during occupancy or partial occupancy of the site by CONTRACTOR's forces while performing any part of the Work.

D. Hazard Communication: Furnish two copies of the CONTRACTOR's Hazard Communication Program required under OSHA regulations before beginning on site activities. Furnish two copies of amendments to Hazard Communications Program as they are prepared.

1.03. TEMPORARY UTILITIES

A. Water: Provide all necessary and required water without additional cost, unless otherwise specified. If necessary, provide and lay water lines to the place of use; secure all necessary permits; pay for all taps to water mains and hydrants and for all water used at the established rates.

B. Light and Power: Provide without additional cost to the OWNER temporary lighting and power facilities required for the proper construction and inspection of the Work. If, in the ENGINEER's opinion, these facilities are inadequate, do NOT proceed with any portion of the Work affected thereby. Maintain temporary lighting and power until the Work is accepted.

C. Heat: Provide temporary heat, whenever required, for work being performed during cold weather to prevent freezing of concrete, water pipes, and other damage to the Work or existing facilities.

D. Sanitary Facilities: Provide sufficient sanitary facilities for construction personnel. Prohibit and prevent nuisances on the site of the Work or on adjoining property. Discharge any employee who violates this rule. Abide by all environmental regulations or laws applicable to the Work.

E. Connections to Existing Utilities

1. Unless otherwise specified or indicated, make all necessary connections to existing facilities including structures, drain lines, and utilities such as water, sewer, gas, telephone, and electricity. In each case, obtain permission from the OWNER or the owning utility prior to undertaking connections. Protect facilities against deleterious substances and damage.

2. Thoroughly plan in advance all connections to existing facilities. Have on hand at the time of undertaking the connections, all material, labor and required equipment. Proceed continuously to complete connections in minimum time. Arrange for the operation of valves or other appurtenances on existing utilities, under the direct supervision of the owning utility.

1.04. TEMPORARY CONSTRUCTION

A. Bridges: Design and place suitable temporary bridges where necessary for the maintenance of vehicular and pedestrian traffic. Assume responsibility for the sufficiency and safety of all such temporary work or bridges and for any damage which may result from their failure or their improper construction, maintenance, or operation. Indemnify and save harmless the OWNER and the OWNER's representatives from all claims, suits or actions, and damages or costs of every description arising by reason of failure to comply with the above provisions.

1.05. BARRICADES AND ENCLOSURES

A. Protection of Workmen and Public: Effect and maintain at all times during the prosecution of the Work, barriers and lights necessary for the protection of Workmen and the Public. Provide suitable barricades, lights, "danger" or "caution" or "street closed" signs and watchmen at all places where the Work causes obstructions to normal traffic, excavation sites, or constitutes in any way a hazard to the public.

B. Barricades and Lights:

1. Protect all streets, roads, highways, excavations and other public thoroughfares which are closed to traffic; use effective barricades which display acceptable warning signs. Locate barricades at the nearest public highway or street on each side of the blocked section.

2. Statutory Requirements: Install and maintain all barricades, signs, lights, and other protective devices within highway rights-of-way in strict conformity with applicable statutory requirements by the authority having jurisdiction.

1.06. FENCES

A. Existing Fences: Obtain written permission from the OWNER prior to relocating or dismantling fences which interfere with construction operations. Reach agreements with the fence owner as to the period the fence may be left relocated or dismantled. Install adequate gates where fencing must be maintained. Keep gates closed and locked at all times when not in use.

B. Restoration: Restore all fences to their original or better condition and to their original location on completion of the Work.

1.07. SECURITY

A. Preservation of Property:

1. Preserve from damage, all property along the line of the Work, in the vicinity of or in any way affected by the Work, the removal or destruction of which is not called for by the Drawings. Preserve from damage, public utilities, trees, lawn areas, building monuments, fences, pipe and underground structures, and public streets. Note: Normal wear and tear of streets resulting from legitimate use by the CONTRACTOR are not considered as damage. Whenever damages occur to such property, immediately restore to its original condition. Costs for such repairs are incidental to the Contract.

2. In case of failure on the part of the CONTRACTOR to restore property or make good on damage or injury, the OWNER may, upon 24 hours written notice, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary, and the cost thereof will be deducted from any moneys due or which may become due the CONTRACTOR under this Contract. If removal, repair or replacement of public or private property is made necessary by alteration of grade or alignment authorized by the OWNER and not contemplated by the Contract Documents, the CONTRACTOR will be compensated, in accordance with the General Conditions, provided that such property has not been damaged through fault of the CONTRACTOR or the CONTRACTOR's employees.

B. Public Utility Installations and Structures:

1. Public utility installations and structures include all poles, tracks, pipes, wires, conduits, vaults, manholes, and other appurtenances and facilities, whether owned or controlled by public bodies or privately owned individuals, firms or corporations, used to serve the public with transportation, gas, electricity, telephone, storm and sanitary sewers, water, or other public or private utility services. Facilities appurtenant to public or private property which may be affected by the Work are deemed included hereunder.

2. The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. Existing public utility installations and structures are indicated on the Drawings only to the extent such information was made available to, or found by, the ENGINEER in preparing the Drawings. These data are not guaranteed for completeness or accuracy, and the CONTRACTOR is responsible for making necessary investigations to become fully informed as to the character, condition, and extent of all public utility installations and structures that may be encountered and that may affect the construction operations.

3. Contact utility locating service sufficiently in advance of the start of construction to avoid damage to the utilities and delays to the completion date.

4. Remove, replace, relocate, repair, rebuild, and secure any public utility installations and structures damaged as a direct or indirect result of the Work under this Contract. Costs for such work are incidental to the Contract. Be responsible and liable for any consequential damages done to or suffered by any public utility installations or structures. Assume and accept responsibility for any injury, damage, or loss which may result from or be consequent to interference with, or interruption or discontinuance of, any public utility service.

5. Repair or replace any water, electric, sewer, gas, or other service connection damaged during the Work with no addition to the Contract price.

6. At all times in performance of the Work, employ proven methods and exercise reasonable care and skill to avoid unnecessary delay, injury, damage, or destruction to public utility installations and structures. Avoid unnecessary interference with, or interruption of, public utility services. Cooperate fully with the owners thereof to that end.

7. Give written notice to the owners of all public utility installations and structures affected by proposed construction operations, sufficiently in advance of breaking ground in any area or on any unit of the Work, to obtain their permission before disrupting the lines and to allow them to take measures necessary to protect their interests. Advise the Chiefs of Police, Fire and Rescue Services of any excavation in public streets or the temporary shut-off of any water main. Provide at least 24 hours notice to all affected property owners whenever service connections are taken out of service.

C. Miscellaneous Structures: Assume and accept responsibility for all injuries or damage to culverts, building foundations and walls, retaining walls, or other structures of any kind met with during the prosecution of the Work. Assume and accept liability for damages to public or private property resulting therefrom. Adequately protect against freezing all pipes carrying liquid.

D. Protection of Trees and Lawn Areas:

1. Protect with boxes, trees and shrubs, except those ordered to be removed. Do not place excavated material so as to cause injury to such trees or shrubs. Replace trees or shrubs destroyed by accident or negligence of the CONTRACTOR or CONTRACTOR's employees with new stock of similar size and age, at the proper season, at no additional cost to the OWNER.

2. Leave lawn areas in as good condition as before the start of the Work. Restore areas where sod has been removed by seeding or sodding.

1.08. TEMPORARY CONTROLS

A. During Construction:

1. Keep the site of the Work and adjacent premises free from construction materials, debris, and rubbish. Remove this material from any portion of the site if such material, debris, or rubbish constitutes a nuisance or is objectionable.

2. Remove from the site all surplus materials and temporary structures when they are no longer needed.

3. Neatly stack construction materials such as concrete forms and scaffolding when not in use. Promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.

4. Properly store volatile wastes in covered metal containers and remove from the site daily.

5. Do not bury or burn on the site or dispose of into storm drains, sanitary sewers, streams, or waterways, any waste material. Remove all wastes from the site and dispose of in a manner complying with applicable ordinances and laws.

B. Smoke Prevention:

1. Strictly observe all air pollution control regulations.

2. Open fires will be allowed only if permitted under current ordinances.

C. Noises:

1. Maintain acceptable noise levels in the vicinity of the Work. Limit noise production to acceptable levels by using special mufflers, barriers, enclosures, equipment positioning, and other approved methods.

2. Supply written notification to the OWNER sufficiently in advance of the start of any work which violates this provision. Proceed only when all applicable authorizations and variances have been obtained in writing.

D. Hours of Operation

1. Operation of construction equipment between the hours of 7:00 p.m. and 6:00 a.m. the following day is prohibited. For operation of this equipment during this period obtain written consent from the OWNER.

2. Do not carry out nonemergency work, including equipment moves, on Sundays without prior written authorization by the OWNER.

E. Dust Control:

1. Take measures to prevent unnecessary dust. Keep earth surfaces exposed to dusting moist with water. Cover materials in piles or while in transit to prevent blowing or spreading dust.

2. Adequately protect buildings or operating facilities which may be affected adversely by dust. Protect machinery, motors, instrument panels, or similar equipment by suitable dust screens. Include proper ventilation with dust screens.

F. Temporary Drainage Provisions:

1. Provide for the drainage of stormwater and any water applied or discharged on the site in performance of the Work. Provide adequate drainage facilities to prevent damage to the Work, the site, and adjacent property.

2. Supplement existing drainage channels and conduits as necessary to carry all increased runoff from construction operations. Construct dikes as necessary to divert increased runoff from entering adjacent property (except in natural channels), to protect the OWNER's facilities and the Work, and to direct water to drainage channels or conduits. Provide ponding as necessary to prevent downstream flooding.

3. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

G. Pollution: Prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from construction activities. Do not permit sanitary wastes to enter any drain or watercourse other than sanitary sewers. Do not permit sediment, debris, or other substances to enter sanitary sewers. Take reasonable measures to prevent such materials from entering any drain or watercourse.

1.09. TRAFFIC REGULATION

A. Parking: Provide and maintain suitable parking areas for the use of all construction workers and others performing work or furnishing services in connection with the Contract, to avoid any need for parking personal vehicles where they may interfere with public traffic or construction activities.

B. Access: Conduct Work to interfere as little as possible with public travel, whether vehicular or pedestrian. Provide and maintain suitable and safe bridges, detours, or other temporary expedients for the accommodation of public and private travel. Whenever it is necessary to cross, obstruct, or close roads, driveways, and walks, whether public or private, give reasonable notice to owners of private drives before interfering with them. Such maintenance of traffic will not be required when the CONTRACTOR has obtained permission from the owner or tenant of private property, or from the authority having jurisdiction over the public property involved, to obstruct traffic at the designated point.

1.10. FIELD OFFICES AND SHEDS

A. CONTRACTOR's Office: Erect, furnish, and maintain a field office with a telephone. Have an authorized agent present at this office at all times while the Work is in progress. Keep readily accessible copies of the Contract Documents, required record documents, and the latest approved shop drawings at this field office.

B. Material Sheds and Temporary Structures: Provide material sheds and other temporary structures of sturdy construction and neat appearance.

C. Location: Coordinate location of field offices, material sheds and temporary structures with ENGINEER and OWNER.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Description

B. Substitutions

C. Manufacturer’s Written Instructions

D. Transportation and Handling

E. Storage, Protection and Maintenance

F. Manufacturer’s Field Quality Control Services

G. Post Startup Services

H. Special Tools and Lubricating Equipment

I. Lubrication

1.02. DESCRIPTION

A. Proposed Manufacturers List: Within 15 calendar days of the date of the Notice to Proceed, submit to the ENGINEER a list of the names of proposed manufacturers, materialmen, suppliers and subcontractors, obtain approval of this list by OWNER prior to submission of any working drawings. Upon request submit evidence to ENGINEER that each proposed manufacturer has manufactured a similar product to the one specified and that it has previously been used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.

B. Furnish and install Material and Equipment which meets the following:

1. Conforms to applicable specifications and standards.

2. Complies with size, make, type, and quality specified or as specifically approved, in writing, by ENGINEER.

3. Will fit into the space provided with sufficient room for operation and maintenance access and for properly connecting piping, ducts and services, as applicable. Make the clear spaces that will be available for operation and maintenance access and connections equal to or greater than those shown and meeting all the manufacturers' requirements. Make all provisions for installing equipment furnished at no increase in Contract Price.

4. Manufactured fabricated in accordance with the following:

a. Design, fabricate, and assemble in accordance with best engineering and shop practices.

b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.

c. Provide two or more items of same kind identical, by same manufacturer.

d. Provide materials and equipment suitable for service conditions.

e. Adhere to equipment capabilities, sizes, and dimensions shown or specified unless variations are specifically approved, in writing, in accordance with the Contract Documents.

f. Adapt equipment to best economy in power consumption and maintenance. Proportion parts and components for stresses that may occur during continuous or intermittent operation, and for any additional stresses that may occur during fabrication or installation.

g. Working parts are readily accessible for inspection and repair, easily duplicated and replaced.

5. Use material or equipment only for the purpose for which it is designed or specified.

1.03. SUBSTITUTIONS

A. Substitutions:

1. CONTRACTOR’s requests for changes in equipment and materials from those required by the Contract Documents are considered requests for substitutions and are subject to CONTRACTOR's representations and review provisions of the Contract Documents when one of following conditions are satisfied.

a. Where request is directly related to an "or equal" clause or other language of same effect in Specifications.

b. Where required equipment or material cannot be provided within Contract Time, but not as result of CONTRACTOR's failure to pursue Work promptly or to coordinate various activities properly.

c. Where required equipment or material cannot be provided in manner compatible with other materials of Work, or cannot be properly coordinated therewith.

2. CONTRACTOR’S Options:

a. Where more than one choice is available as options for CONTRACTOR's selection of equipment or material, select option compatible with other equipment and materials already selected (which may have been from among options for other equipment and materials).

b. Where compliance with specified standard, code or regulation is required, select from among products which comply with requirements of those standards, codes, and regulations.

c. “Or Equal”: For equipment or materials specified by naming one or more equipment manufacturer and "or equal", submit request for substitution for any equipment or manufacturer not specifically named.

B. Conditions Which are Not Substitution:

1. Requirements for substitutions do not apply to CONTRACTOR options on materials and equipment provided for in the Specifications.

2. Revisions to Contract Documents, where requested by OWNER or ENGINEER, are "changes" not "substitutions".

3. CONTRACTOR's determination of and compliance with governing regulations and orders issued by governing authorities do not constitute substitutions and do not constitute basis for a Change Order, except as provided for in Contract Documents.

1.04. MANUFACTURER'S WRITTEN INSTRUCTIONS

A. Instruction Distribution: When the Contract Documents require that installation, storage, maintenance and handling of equipment and materials comply with manufacturer's written instructions, obtain and distribute printed copies of such instructions to parties involved in installation, including six copies to ENGINEER.

1. Maintain one set of complete instructions at jobsite during storage and installation, and until completion of work.

B. Manufacturer's Requirements: Store, maintain, handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's written instructions and in conformity with Specifications.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult ENGINEER for further instructions.

2. Do not proceed with work without written instructions.

C. Performance Procedures: Perform work in accordance with manufacturer's written instructions. Do not omit preparatory steps or installation procedures, unless specifically modified or exempted by Contract Documents.

1.05. TRANSPORTATION AND HANDLING

A. Coordination with Schedule: Arrange deliveries of materials and equipment in accordance with Construction Progress Schedules. Coordinate to avoid conflict with work and conditions at site.

1. Deliver materials and equipment in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Protect bright machined surfaces, such as shafts and valve faces, with a heavy coat of grease prior to shipment.

3. Immediately upon delivery, inspect shipments to determine compliance with requirements of Contract Documents and approved submittals and that material and equipment are protected and undamaged.

B. Handling: Provide equipment and personnel to handle material and equipment by methods recommended by manufacturer to prevent soiling or damage to materials and equipment or packaging.

1.06. STORAGE, PROTECTION AND MAINTENANCE

A. On-site storage areas and buildings:

1. Conform storage buildings to requirements of Section 01500 – Construction Facilities and Temporary Controls.

2. Coordinate location of storage areas with ENGINEER and OWNER.

3. Arrange on site storage areas for proper protection and segregation of stored materials and equipment with proper drainage. Provide for safe travel around storage areas and safe access to stored materials and equipment.

4. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

5. Store materials such as pipe, reinforcing and structural steel, and equipment on pallets, blocks or racks, off ground.

6. PVC Pipe may be damaged by prolonged exposure to direct sunlight and the CONTRACTOR shall take necessary precautions during storage and installation to avoid this damage. Pipe shall be stored under cover, and installed with sufficient backfill to shield it from the sun.

7. Store fabricated materials and equipment above ground, on blocking or skids, to prevent soiling or staining. Cover materials and equipment which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

B. Interior Storage:

1. Store materials and equipment in accordance with manufacturer's instructions, with seals and labels intact and legible.

2. Store materials and equipment, subject to damage by elements, in weathertight enclosures.

3. Maintain temperature and humidity within ranges required by manufacturer's instructions.

C. Accessible Storage: Arrange storage in a manner to provide easy access for inspection and inventory. Make periodic inspections of stored materials or equipment to assure that materials or equipment are maintained under specified conditions and free from damage or deterioration.

1. Perform maintenance on stored materials of equipment in accordance with manufacturer's instructions, in presence of OWNER or ENGINEER.

2. Submit a report of completed maintenance to ENGINEER with each Application for Payment.

3. Failure to perform maintenance, to notify ENGINEER of intent to perform maintenance or to submit maintenance report may result in rejection of material or equipment.

D. OWNER’s Responsibility: OWNER assumes no responsibility for materials or equipment stored in buildings or on-site. CONTRACTOR assumes full responsibility for damage due to storage of materials or equipment.

E. CONTRACTOR’s Responsibility: CONTRACTOR assumes full responsibility for protection of completed construction. Repair and restore damage to completed Work equal to its original condition.

F. Special Equipment: Use only rubber tired wheelbarrows, buggies, trucks, or dollies to wheel loads over finished floors, regardless if the floor has been protected or not. This applies to finished floors and to exposed concrete floors as well as those covered with composition tile or other applied surfacing.

G. Surface Damage: Where structural concrete is also the finished surface, take care to avoid marking or damaging surface.

1.07. MANUFACTURER'S FIELD QUALITY CONTROL SERVICES

A. General:

1. Provide manufacturer's field services in accordance with this subsection for those tasks specified in other sections.

2. Include and pay all costs for suppliers' and manufacturers' services, including, but not limited to, those specified.

B. Installation Instruction: Provide instruction by competent and experienced technical representatives of equipment manufacturers or system suppliers as necessary to resolve assembly or installation procedures which are attributable to, or associated with, the equipment furnished.

C. Installation Inspection, Adjustments and Startup Participation:

1. Provide competent and experienced technical representatives of equipment manufacturers or system suppliers to inspect the completed installation as follows.

a. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or for other conditions which may cause damage.

b. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

c. Verify that wiring and support components for equipment are complete.

d. Verify that equipment or system is installed in accordance with the manufacturer's recommendations, approved shop drawings and the Contract Documents.

e. Verify that nothing in the installation voids any warranty.

2. Provide manufacturer's representatives to perform initial equipment and system adjustment and calibration conforming to the manufacturer's recommendations and instructions, approved shop drawings and the Contract Documents.

3. Obtain ENGINEER's approval before start-up of equipment. Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturers' instructions.

4. Furnish ENGINEER with three copies of the following. When training is specified, furnish the copies at least 24 hours prior to training.

a. "Certificate of Installation, Inspection and Start-up Services" by manufacturers' representatives for each piece of equipment and each system specified, certifying:

1) That equipment is installed in accordance with the manufacturers' recommendations, approved shop drawings and the Contract Documents.

2) That nothing in the installation voids any warranty.

3) That equipment has been operated in the presence of the manufacturer's representative.

4) That equipment, as installed, is ready to be operated by others.

b. Detailed

1) Description of calibration and adjustments if made; if not in Operation and Maintenance Manuals, attach copy.

2) Description of any parts replaced and why replaced.

3) Type, brand name, and quantity of lubrication used, if any.

4) General condition of equipment.

5) Description of problems encountered, and corrective action taken.

6) Any special instructions left with CONTRACTOR or ENGINEER.

D. Field Test Participation: Provide competent and experienced technical representatives of all equipment manufacturers and system suppliers as necessary to participate in field testing of the equipment specified in Section 01400 – Quality Control.

E. Trouble-Free Operation: Provide competent and experienced technical representatives of all equipment manufacturers and system suppliers as necessary to place the equipment in trouble-free operation after completion of start-up and field tests.

1.08. POST START-UP SERVICES

A. General: Provide Post Start-up Services in accordance with this subsection for equipment specified in other sections.

B. Site Visit: Provide the services of an authorized service representative for each equipment manufacturer or system supplier to make a final site visit after the equipment or system has been in operation for at least 6 months, but no longer than 11 months. Furnish assistance to OWNER's operating personnel in making adjustments and calibrations required to determine that the equipment and system is operating in conformance with design, manufacturer's, and specification requirements. Instruct the personnel in a review of proper operation and maintenance procedures.

C. Certificate: Furnish "Certificate of Post Start-up Services" cosigned by ENGINEER and the manufacturer's representative, certifying that this service has been performed. Use form provided in this section, and furnish OWNER with three copies.

1.09. SPECIAL TOOLS AND LUBRICATING EQUIPMENT

A. General: Furnish, per manufacturer's recommendations, special tools required for checking, testing, parts replacement, and maintenance. (Special tools are those which have been specially designed or adapted for use on parts of the equipment, and which are not customarily and routinely carried by maintenance mechanics.)

B. Time of Delivery: Deliver special tools and lubricating equipment to OWNER when unit is placed into operation and after operating personnel have been properly instructed in operation, repair, and maintenance of equipment.

C. Quality: Provide tools and lubricating equipment of a quality meeting equipment manufacturer's requirements.

1.10. LUBRICATION

A. General: Where lubrication is required for proper operation of equipment, incorporate in the equipment the necessary and proper provisions in accordance with manufacturer's requirements. Where possible, make lubrication automated and positive.

B. Oil Reservoirs: Where oil is used, supply reservoir of sufficient capacity to lubricate unit for a 24-hour period.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Warranties and Bonds

B. Record Drawings

C. Special Tools

1.02. WARRANTIES AND BONDS

A. Prior to final payment, deliver to the OWNER the original and one copy of all bonds, warranties, guarantees and similar documents, including those customarily provided by manufacturers and suppliers which cover a period greater than the one year correction period. Show OWNER as beneficiary of these documents.

1.03. RECORD DRAWINGS

A. At the site keep and maintain one record copy of all Contract Documents, reference documents and all technical documents submitted in good order. As the work progresses the CONTRACTOR shall record on one set of reproducible drawings all changes and deviations from the original Plans. CONTRACTOR shall record the exact location of all changes in vertical and horizontal alignment by offsets and ties at each; sewer, water, electric, gas, communication and other services by off-set distance to permanent improvements such as building and curbs.

B. Prior to acceptance of the project and before final payment is made, the Engineer shall submit one (1) set of reproducible drawings, two (2) sets of blueline or blackline prints, all marked "Drawings of Record". These Record Drawings must be certified by the Florida Registered Professional Engineer, who prepared the plans and signs and seals these plan, and submits AutoCAD compatible diskette copy of the drawings, and other applicable related records to the Department of Lee County Utilities.

C. These Record Drawings must be certified by the Florida Registered Professional Engineer, who prepared the plans and signs and seals these plans.

D. On case by case basis, Lee County Utilities may waive the requirement for certification by a Professional Land Surveyor, licensed in the State of Florida. However, prior consent must first be obtained from Lee County Utilities. The County shall withhold final acceptance of the project until the requirement for record drawings and related records has been met. Record Drawings without detailed field verified horizontal and vertical locations of all facilities shown will be rejected.

1.04. SPECIAL TOOLS

A. Special tools are considered to be those tools which, because of their limited use, are not normally available but which are necessary for maintenance of particular equipment.

B. For each type of equipment provided under this CONTRACT, furnish a complete set of all special tools including grease guns and other lubricating devices, which may be needed for the adjustment, operation, maintenance, and disassembly of such equipment. Furnish only tools of high grade, smooth forged alloy tool steel. Manufacture grease guns of the lever type.

PART 2 PPRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the CONTRACTOR's special warranty of workmanship and materials.

2. General closeout requirements are included in Section 01700 – Contract Closeout

3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Divisions 02 through 16.

4. Certifications and other commitments and agreements for continuing services to OWNER are specified elsewhere in the Contract Documents.

B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the CONTRACTOR of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the CONTRACTOR.

1.02. WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The CONTRACTOR is responsible for the cost of replacing or rebuilding defective Work regardless of whether the OWNER has benefited from use of the Work through a portion of its anticipated useful service life.

D. OWNER's Recourse: Written warranties made to the OWNER are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the OWNER can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents

E. The OWNER reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work,

until evidence is presented that entities required to countersign such commitments are willing to do so.

1.03. SUBMITTALS

A. Submit written warranties to the ENGINEER prior to the date certified for Substantial Completion. If the ENGINEER's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the ENGINEER.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

NOT USED.

END OF SECTION

SECTION 02060

DEMOLITION

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Demolition and removal of tanks, related structures, equipment, related piping, and residual tank contents.

B. Demolition and removal of process equipment and piping.

C. Demolition of piping and appurtenances.

D. Demolition and removal of structures.

E. Selective demolition of piping and structures

1.02. RELATED SECTIONS

A. Section 01010 – Summary of Work

B. Section 02223 – Backfilling

C. Section 16056 – Electrical Demolition

1.03. DEFINITIONS

A. Remove: Detach items from existing items/structures/facilities/piping to remain and legally dispose of them off-site unless indicated to be removed and salvaged.

1. Existing piping, tankage, equipment, machinery, instrumentation, etc., in or on the structures, not claimed as salvage by the OWNER, shall also become the property of the CONTRACTOR and may not be disposed of on the Site but removed and disposed of in a lawful manner off site.

B. Remove and Salvage: Carefully detach from existing items/structures/facilities/piping to remain, in a manner to prevent damage.

1. The OWNER has the right to claim as salvage, any items and materials removed under the Work of this Section. Should such right of salvage be exercised by the OWNER, move and neatly store removed items on the site in a location agreeable to the OWNER, in a manner approved by the ENGINEER. CONTRACTOR is responsible for maintaining the equipment in its existing condition and adequately protecting it during removal until the time it is provided to the OWNER.

C. Existing to Remain: Existing items/structures/facilities/piping that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04. SUBMITTALS

A. Submit under provisions of Section 01300 – Submittals.

B. Site Inspection

1. Visit both of the site locations and inspect all existing structures that are scheduled to remain following the work of demolition. Observe and record any defects that may exist in buildings or structures adjacent to but not directly affected by the demolition work. Provide the OWNER with a copy of this inspection record and obtain the either OWNER's approval prior to commencing the demolition.

C. Shop Drawings

1. For both locations, submit proposed demolition plan together with any necessary diagrams and/or drawings, taking into account OWNER’s continuing occupancy, sequence of construction of the project, and disconnections from in-service facilities.

2. Demolition plan shall include the following:

   a. Demolition, removal, and disposition of items identified in this Section.

   b. Disposal locations of removed items.

   c. Time lines and sequences of operations.

   d. Location of temporary barricades, fences, and signs.

   e. Provisions for disposal of sludge, grit, debris, tank contents (e.g. filter material), and hazardous materials (if any).

   f. Provisions for recycling of demolition debris (e.g. aluminum, steel, other recyclable materials).

3. Submit proposed insertion valves and caps (e.g. caps, blind flanges, etc.), all applicable sizes and pipe types.

4. Submit proposed operation and installation plan and materials for plugging sanitary sewer and drain lines as specified or required to be abandoned at in-service manholes to complete the Work of demolition.

5. As applicable, asbestos-related work and lead-based-paint- related work, submittals include the following:

   a. The asbestos abatement CONTRACTOR shall submit a 10 day Notice of Demolition or Asbestos Renovation form in accordance with Florida Administrative Code (FAC) 62-257 to the FDEP and OWNER, and provide the ENGINEER with a copy of the notice.

   b. Employee list of supervisor(s) and workers including applicable EPA training accreditation and last four digits of Social Security number to be used on the project.

   c. Copies of training and medical records for the abatement works and the Abatement Site Supervisor. The site supervisor shall meet the requirements of A Competent person, per the OSHA Standard 29 CFR 1926.1101.

   d. Copies of training and medical records for the lead workers and the site supervisor in accordance with OSHA Lead in construction Standard 29 CFR 1926.62 The site supervisor shall meet the requirements of a competent person, per the OSHA Standard.

   e. Disposal manifests of all asbestos containing materials (ACM) showing receipt at a Florida landfill approved for asbestos waste.

f. Disposal manifests of all lead related scrap metal showing receipt at a licensed scrap yard.

g. If applicable, completed waste profile and hazardous waste disposal manifest(s) showing disposal of lead based paint waste generated at the site(s) at a properly permitted hazardous waste landfill.

h. Daily logs of work activities included names and times of workers on the job site and summary of work completed for the day. Note any atypical activities or events.

1.05. PROJECT RECORD DRAWINGS AND PHOTOGRAPHS

A. Submit under provisions of Section 01300 – Submittals.

B. Accurately record surveyed, by registered surveyor, locations and elevations of capped utilities, subsurface obstructions, facilities abandoned in-place below ground (e.g. duct banks, tanks, piping, wet wells, etc.), piping abandoned in place below ground, and any facilities within the limits of demolition remaining in place.

C. Record Drawings shall include notes indicating Motor Control Centers (MCCs) buckets that have been placed out-of-service.

1.06. REGULATORY REQUIREMENTS

A. Conform to applicable codes for demolition of structures, protection of adjacent structures, dust control, runoff control, and disposal of materials.

B. Obtain required permits from authorities.

C. Notify affected utility companies, including the OWNER (i.e. Lee County Utilities) before starting demolition operations and comply with their requirements.

D. Do not close or obstruct roadways without required permits.

E. Conform to applicable regulatory procedures if a hazardous environmental condition is encountered at site or if hazardous material disposal is required.

1.07. HAZARDOUS ENVIRONMENTAL CONDITIONS

A. If an unknown unforeseeable hazardous environmental condition is encountered at the site, or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a hazardous environmental condition, immediately:

1. Secure or otherwise isolate such condition;

2. Stop all Work in connection with such condition and in any area affected thereby; and,

3. Notify OWNER and ENGINEER (and promptly thereafter confirm such notice in writing).

B. Resume Work in connection with such condition or in any affected area only after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR a written notice specifying under what special conditions Work may be resumed safely.

1.08. SEQUENCING AND SCHEDULE

A. Sequence demolition work to conform to provisions of Section 01010 – Summary of Work.

B. Schedule the work so as not to interfere with the day to day operation of the existing facilities.

1.09. FIELD CONDITIONS

A. OWNER will occupy the area of in-service facilities during construction. Conduct demolition and selective demolition so OWNER's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by OWNER as far as practical.

C. Notify ENGINEER of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If suspected and unidentified hazardous materials are encountered, do not disturb; immediately notify ENGINEER and OWNER.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during demolition and selective demolition operations.

1.10. QUALITY ASSURANCE

A. Limits: Exercise care to break concrete well for removal in reasonably small masses. Where only parts of a structure are to be removed, cut the concrete along limiting lines with a suitable saw so that damage to the remaining structure is held to a minimum.

1.11. MATERIALS OWNERSHIP

A. Unless otherwise indicated, all demolition waste becomes property of CONTRACTOR.

1.12. QUALIFICATIONS

A. Demolition Firm - Company specializing in performing Work of this Section with minimum three (3) years of documented experience.

PART 2 PRODUCTS

2.01. FILL MATERIAL

A. Fill Material – Select Fill or Common Fill as specified in Section 02223 – Backfilling.

2.02. PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with state, federal and local governing notification regulations before beginning demolition and selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 EXECUTION

3.01. PREPARATION

A. Not more than seven days prior to performing any demolition, there shall be a coordination meeting between the CONTRACTOR, OWNER, and ENGINEER to discuss the CONTRACTOR's Demolition Plan and related procedures. Items to be discussed shall be, but not limited to, dust control, sequence of work, removal of material, protection of existing equipment, disconnections from in-service facilities, access and egress of material, etc. Demolition procedures must be coordinated with the OWNER's operating personnel and operations, and adjusted accordingly, if necessary.

1. Following the coordination meeting, begin demolition operations after obtaining written authorization to proceed from the OWNER.

B. Notify OWNER and ENGINEER at least 48 hours in advance of intended start of demolition operations in each affected area.

C. Carry out demolition so that adjacent structures, which are to remain, are not endangered. Protect existing structures, equipment, appurtenances, architectural features, and materials which are not to be demolished. Prevent movement or settlement of adjacent structures that will be remaining in place.

D. Protect existing site-related items such as pavements, walkways, parking areas, curbs, aprons, and landscaping features which are not to be demolished.

E. Protect existing in-service electrical; piping; stormwater collection systems; facilities and structures, including related components, which are not to be demolished.

F. Mark location of underground utilities. Verify that utilities have been disconnected and capped before starting demolition and selective demolition operations.

G. Review record documents of existing construction provided by OWNER. OWNER does not guarantee that existing conditions are same as those indicated in record documents.

H. Survey existing conditions and correlate with requirements indicated to determine extents of demolition and selective demolition required.

I. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to ENGINEER.

3.02. PROTECTION

A. General Safety: Provide temporary warning signs, protective barriers or barricades, and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain. Maintain these items during the demolition period.

1. Protect walls and other existing finish work that are to remain during selective demolition operations. For example, at the Waterway Estates WTP, protect exterior wall of high service pump station during removal of attached canopy.

B. Existing Services: Undertake no demolition work until all mechanical and electrical services affected by the work have been properly disconnected. Cap, reroute or reconnect interconnecting piping or electrical services that are to remain in service either permanently or temporarily in a manner that will not interfere with the operation of the remaining facilities.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of existing structures/facilities to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

D. Permanent Shoring: Provide structural supports as required to preserve stability and prevent movement, settlement, or collapse of existing facilities to remain. For example, at the Fort Myers Beach WWTP, the CONTRACTOR shall provide pipe supports for each of five (5) effluent pipe branches and valves. Pipe supports shall be reviewed and approved by ENGINEER and OWNER.

E. Hazards: Perform testing and air purging where the presence of hazardous chemicals, gases, flammable materials or other dangerous substances is apparent or suspected, and eliminate the hazard before demolition is started.

3.03. UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be demolished and/or selectively demolished.

3.04. DEMOLITION REQUIREMENTS

A. Explosives: The use of explosives will not be permitted.

B. Fire: The use of fire to burn debris will not be permitted.

C. Protection: Carefully protect all in-service piping, tankage, and associated equipment (i.e. mechanical, electrical, and instrumentation) against dust and debris.

D. Removal: Remove all debris from the structures during demolition and do not allow debris to accumulate in piles.

E. Access: Provide safe access to and egress from all working areas at all times with adequate protection from falling material.

F. Protection: Provide adequate scaffolding, shoring, bracing railings, toe boards and protective covering during demolition to protect personnel and equipment against injury or damage. Cover floor openings not used for material drops with material substantial enough to support any loads placed on it. Properly secure the covers to prevent accidental movement.

G. Lighting: Provide adequate lighting at all times during demolition.

H. Power: Provide temporary power as needed during demolition.

I. Closed Areas: Close areas below demolition work to anyone while removal is in progress.

J. Material Drops: Do not drop any material to any point lying outside the exterior walls of the structure unless the area is effectively protected.

K. Existing Items to Remain: Protect existing facilities indicated to remain against damage and soiling during selective demolition.

L. Confine demolition operations within the contract specified “limits of demolition” which are designated areas of the site.

M. Conduct operations to minimize interference with adjacent and occupied facility areas. Maintain protected egress and access at all times.

N. Cease operations immediately if adjacent structures appear to be in danger. Notify OWNER and ENGINEER. Do not resume operations until directed.

O. All materials scheduled for demolition shall become the property of the CONTRACTOR and shall be disposed of in accordance with all applicable federal, state, and local regulations.

P. Dispose of designated hazardous materials in accordance with the nature of the material, required handling and disposal procedures, regulatory requirements, and applicable permits.

3.05. DEMOLITION

A. General: Demolish and remove items/structures/facilities/piping to the extents indicated as the limits of demolition. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage facilities to remain. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.

B. Break up and remove slabs-on-grade, and concrete or other material walkways, etc., and related items within the limits of demolition and not otherwise identified to be saved or salvaged or remain in-service (“S”).

C. Break up and remove foundation walls, footings, etc., including any below-grade concrete slabs, to a point three (3) feet below grade, unless otherwise specified for a specific structure/facility.

D. Break up and remove concrete, metal, plastic, and other material structures and tanks, including walls, base slabs, cover slabs, etc.

E. Empty and remove buried tanks and associated piping, to a point three (3) feet below grade, unless otherwise specified for a specific structure/facility.

F. Backfill, compact, and rough grade areas excavated, including cavities created by removal of demolished items, in accordance with Section 02223 - Backfilling using fill material specified in PART 2.

G. Disconnect, cap, and identify utilities at the limits of demolition.

H. Disconnect and remove designated facility/process piping systems, including valves and fittings.

I. Detach, dismantle, and remove metal components of process equipment from designated tanks, including miscellaneous metal work items associated with access to and operation of such equipment.

J. Remove and dispose of demolished materials as work progresses. Do not burn materials and do not bury materials.

K. If damaged during demolition activities, patch and refinish or restore existing and adjoining surfaces that are to remain.

L. Remove temporary barricades, partitions, signs, etc.

M. Remove and dispose of residual materials such as grit, sludge, debris, trash, and other scrap.

N. Upon completion of demolition operations, leave areas in a clean condition.

3.06. SCHEDULES

A. Tanks and Related Structures

1. Liquid storage tanks, including piping, concrete encasements, and secondary containments.

2. Removal and disposal of sediments and sludge from tanks.

3. Water and wastewater treatment tanks and appurtenances.

4. Concrete/masonry structures attached or related to above tanks.

5. Stairways, railings, ladders, walkways, miscellaneous metal, and other items associated with above tanks and structures.

6. Concrete foundations, floor slabs, pads.

7. Process piping, fittings, valves, and utilities located within or attached to above tanks and structures.

8. Disconnecting and capping of identified utilities.

9. Filling below-grade cavities and excavations (created by removed tanks and structures) with approved materials.

B. Process Equipment and Piping

1. Equipment, supports, anchors, concrete pads, and associated items.

2. Piping, fittings, valves, hangers, concrete supports and associated items.

3. Meters, gages, recording instruments, and other measuring devices.

4. Weir plates, walkways, railings, floor grates, stairways, ladders, and other miscellaneous metal and non-metal items.

5. Chemical storage tanks, supports, and associated piping.

6. Disconnecting and capping of identified utilities.

C. Electrical Demolition

1. Refer to Section 16056 – Electrical Demolition.

2. Electrical wiring to be terminated shall be completely removed back to the nearest junction box unless otherwise specified.

3. Demolition and proper disposal includes all applicable PCB-containing transformers, switches, and capacitors.

3.07. LIMITS OF DEMOLITION

A. Unless otherwise noted on the Drawings or in the Specifications, all aboveground piping that is scheduled to be demolished to a depth of three (3) feet below the ground surface and removed for proper disposal. CONTRACTOR shall provide and install clean backfill as required to return ground surface to an elevation matching surrounding elevations.

B. Unless otherwise noted on the Drawings or in the Specifications, all piping that is scheduled for demolition that is greater than three (3) feet below land surface shall be abandoned in-place and capped. Pipe that is abandoned in place shall be surveyed to provide location and elevation information on Record Drawings for all end-points, and any known bends, of pipe abandoned in place. Abandoned pipe that is deemed to be in poor structural condition may require flowable fill prior to abandonment. CONTRACTOR shall notify OWNER and ENGINEER if such piping is encountered. Flowable fill shall be used on a case by case basis as deemed necessary by OWNER and ENGINEER.

C. Unless otherwise noted on the Drawings or in the Specifications, piping that extends from greater than three (3) feet below land surface up to or beyond land surface, shall be removed down to either 3 feet below land surface or to the first joint below land surface, whichever is higher. These locations shall be surveyed to provide location and elevation information on Record Drawings.

D. Unless otherwise noted on the Drawings or in the Specifications, all tankage that is scheduled for demolition that is within three (3) feet below land surface shall be demolished, including any footings. Any footings that extend beyond three (3) feet below land surface shall also be removed if not practicable to leave in place.

E. Unless otherwise noted on the Drawings or in the Specifications, all tankage that is scheduled for demolition that extends beyond three (3) feet below land surface shall be demolished to approximately three (3) feet below land surface and a minimum of two (2) drain holes installed in the bottom of each tank area. Tanks that are abandoned in place shall be surveyed to provide location and elevation information on Record Drawings.

F. Unless otherwise noted on the Drawings or in the Specifications as in-service piping to remain in-service, all piping within the limits of demolition as defined on the Drawings that is associated with the structures scheduled for demolition, above and below ground, shall be demolished or abandoned in-place per the Drawings or in the Specifications, whether or not the piping is shown or described on the plans and in the specifications.

    1. Concrete electrical duct banks may exist throughout the sites within 3 feet below land surface. Concrete electrical duct banks may be abandoned in place.

    2. All stormwater collection system piping, catch basins, manholes, and other associated structures (e.g. headwalls) are to remain in-service at all three locations, whether or not they are depicted on the Drawings.

G. If piping to be demolished or abandoned in-place extends beyond the limits of demolition, the piping shall be demolished or abandoned in-place up to the limits of demolition. Piping extending beyond limits of demolition shall be cut/capped at the limits of demolition and surveyed.

3.08. DISPOSAL OF MATERIALS

A. Dispose of demolished items and materials promptly.

B. Final Removal: Remove all debris, piping, rubble, rubbish, scrap metal, scrap pieces, equipment, and materials resulting from the demolition unless otherwise indicated. Take title to all demolished materials and salvaged materials for recycling, and remove such items from the site.

1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris and materials (e.g. remaining residuals/contents from tanks) in a manner that will prevent spillage on adjacent surfaces and areas.

C. Burning: Do not burn demolished materials.

D. OWNER's Property: Within the limits of demolition, the OWNER has not identified any items to be salvaged.

E. For select remaining residuals and contents in tanks (e.g. filter media), waste characterizations have been approved by Waste Management Inc. The waste characterization forms and approvals are provided in Appendix B to these Technical Specifications. While the OWNER is the generator of the waste, the CONTRACTOR shall assume and be responsible for the costs of proper handling, transortation and disposal of all wastes, including those characterized. The billing address on approved waste characterization forms shall be amended to the CONTRACTOR's name and address. While the waste characterization forms contain an estimate of the volume of waste, the CONTRACTOR shall verify volumes prior to submitting his bid. The Work includes proper handling and disposal of all wastes, whether or not their volume is found to be greater than the volume indicated on the waste characterization forms and approvals. Waste Management, Inc. has approved the select characterized wastes for disposal in the Lee Hendry Landfill. The CONTRACTOR may dispose of wastes at another landfill at his cost including any additional analyses for waste characterization, transportation and disposal costs. Not all anticipated wastes have been waste characterized. The CONTRACTOR shall be responsible for waste characterization and proper disposal of all wastes.

3.09. CLEANING

A. Clean adjacent structures of dust, dirt, and debris caused by demolition and selective demolition operations. Return adjacent areas to condition existing before demolition operations began.

3.10. ASBESTOS REMOVAL AND DISPOSAL

A. Asbestos removal and disposal shall be in accordance with all applicable federal, state, and local regulations.

B. All work shall be performed in accordance with work practice in National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 61.145 and OSHA 40 CFR 1926.1101.

C. General CONTRACTOR shall be responsible for determining extent of asbestos in existing facilities in addition to removal and disposal. CONTRACTOR or inspector shall be certified to perform inspection. Include costs for inspections, removals, and proper disposal in lump sum fee.

D. Submit completed inspection report to ENGINEER and OWNER describing extent and quantity of asbestos prior to any demolition.

E. In the event that asbestos is found on site beyond that already identified, prepare a request for a change of contract price. Final price shall be subject to negotiation with OWNER.

F. Asbestos if present shall be removed prior to any other structural demolition work at the facility.

G. All work area will be demarcated and access restricted to only necessary personal.

H. Removal shall be provided by personnel with proper certification.

I. CONTRACTOR is responsible for employee exposure air monitoring where required.

J. All work will be performed using wet abatement techniques.

K. All asbestos materials shall be immediately bagged.

L. Only HEPA filter equipped vacuums shall be utilized on the project.

M. Final/Clearance inspection shall be accomplished by visual inspection from the ENGINEER.

N. All necessary regulatory notification shall be prepared and submitted by CONTRACTOR in the required time prior to asbestos removal.

3.11. LEAD BASED PAINT RELATED WORK

A. All work shall be performed in accordance with OSHA 29 CFR 1926.62.

B. CONTRACTOR is responsible for employee exposure air monitoring where required.

C. CONTRACTOR is responsible for determining proper personal protective equipment (PPE) and respiratory protection in accordance with an OSHA exposure assessment.

D. In areas where lead based paint work is being performed, care shall be taken to ensure lead based paint does not polluted the surrounding ground. Drop cloth or other means of containment shall be used. The area shall be cleaned immediately to prevent tracking of paint related waste.

END OF SECTION

SECTION 02161

SHORING, SHEETING AND BRACING

PART 1 GENERAL

1.01. SUMMARY

A. Section Includes: Work required for protection of an excavation or structure through shoring, sheeting, and bracing.

B. Related Sections

1. Section 02222 – Excavation

2. Section 02223 – Backfilling

1.02. SUBMITTALS

A. General: Provide all submittals, including the following, as specified in Division 01.

B. CONTRACTOR’s Submittals: All sheeting and bracing shall be the responsibility of the CONTRACTOR to retain qualified design services for these systems, and to be completed with strict adherence to OSHA Regulations. Submit complete design calculations and working drawings of proposed shoring, sheeting and bracing which have been prepared, signed and sealed by a Licensed Professional Engineer experienced in Structural Engineering and registered in the State of Florida, before starting excavation. ENGINEER's review of calculations and working drawings will be limited to confirming that the design was prepared by a licensed professional engineer.

1.03. REFERENCES

A. Design: Comply with all Federal and State laws and regulations applying to the design and construction of shoring, sheeting and bracing.

B. N.B.S. Building Science Series 127 "Recommended Technical Provisions for Construction Practice in Shoring and Sloping Trenches and Excavations.

1.04. QUALITY ASSURANCE

A. Regulatory Requirements: Do work in accordance with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54), and the Florida Trench Safety Act. The CONTRACTOR shall also observe 29 CFR 1910.46 OSHA’s regulation for Confined Space Entry.

PART 2 PRODUCTS

2.01. MANUFACTURERS AND MATERIALS

A. Material Recommendations: Use manufacturers and materials for shoring, sheeting and bracing as recommended by the Licensed Professional Engineer who designed the shoring, sheeting, and bracing.

1. Wood Materials: Oak, or treated fir or pine for wood lagging.

PART 3 EXECUTION

3.01. SHORING, SHEETING AND BRACING INSTALLATION

A. General: Provide safe working conditions, to prevent shifting of material, to prevent damage to structures or other work, to avoid delay to the work, all in accordance with applicable safety and health regulations. Properly shore, sheet, and brace all excavations which are not cut back to the proper slope and where shown. Meet the general trenching requirements of the applicable safety and health regulations for the minimum shoring, sheeting and bracing for trench excavations.

1. CONTRACTOR's Responsibility: Sole responsibility for the design, methods of installation, and adequacy of the shoring, sheeting and bracing.

B. Arrange shoring, sheeting and bracing so as not to place any strain on portions of completed work until the general construction has proceeded far enough to provide ample strength.

C. If ENGINEER is of the opinion that at any point the shoring, sheeting or bracing are inadequate or unsuited for the purpose, resubmission of design calculations and working drawings for that point may be ordered, taking into consideration the observed field conditions. If the new calculations show the need for additional shoring, sheeting and bracing, it should be installed immediately.

D. Monitoring: Periodically monitor horizontal and vertical deflections of sheeting. Submit these measurements for review.

E. Accuracy locate all underground utilities and take the required measures necessary to protect them from damage. All underground utilities shall be kept in service at all times as specified in Division 01.

F. Driven Sheeting: Drive tight sheet piling in that portion of any excavation in paved or surface streets City collector and arterial streets and in State and County highways below the intersection of a one-on-one slope line from the nearest face of the excavation to the edge of the existing pavement or surface.

G. Sheeting Depth: In general drive or place sheeting for pipelines to a depth at elevation equal to the top of the pipe as approved.

1. If it is necessary to drive sheeting below that elevation in order to obtain a dry trench or satisfactory working conditions, cut the sheeting off at the top of the pipe and leave in place sheeting below the top of the pipe.

2. Cut off sheeting not designated as "Sheeting Left in Place". The cut ends of sheeting left adjacent to the pipe will be paid for as "Sheeting Left in Place".

3. Do not cut the sheeting until backfill has been placed and compacted to the top of the pipe.

H. Sheeting Removal: In general, remove sheeting and bracing above the top of the pipe as the excavation is refilled in a manner to avoid the caving in of the bank or disturbance to adjacent areas or structures. Sheeting shall be removed as backfilling progresses so that the sides are always supported or when removal would not endanger adjacent structures. When required to eliminate excessive trench width or other damages, shoring or bracing shall be left in place and the top cut off at an elevation 3 feet below finished grade, unless otherwise directed.

1. Carefully fill voids left by the withdrawal of the sheeting by jetting, ramming or otherwise.

2. No separate payment will be made for filling of such voids.

I. Permission for Removal: Obtain permission before the removal of any shoring, sheeting or bracing. Retain the responsibility for injury to structures or to other property or persons from failure to leave such shoring, sheeting and bracing in place even though permission for removal has been obtained.

J. Preload internal braces to 50 percent of the design loads.

K. Proof test tie backs to 133 percent of the design loads and lock off tie backs at 75 percent of the design loads.

3.02. SHEETING LEFT IN PLACE FOR PROTECTION

A. Ordered Left in Place: In addition to sheeting specified or shown to be left in place, the ENGINEER may order, in writing, any or all other shoring, sheeting or bracing to be left in place for the purpose of preventing injury to the structures, pipelines or to other property or to persons.

1. Cutoff sheeting left in place at the elevation shown or ordered, but, in general, at least 3 feet below the final ground surface.

2. Drive up tight any bracing remaining in place.

B. Right to Order: Do not construe the right to order shoring, sheeting and bracing left in place as creating any obligation to issue such orders.

C. Payment: Shoring, sheeting and bracing left in place, by written order, will be paid for under the appropriate Contract Items or where no such items exist, as changes in the work.

END OF SECTION

SECTION 02205

PROTECTION OF EXISTING FACILITIES

PART 1 GENERAL

1.01. SUMMARY OF WORK

A. Location of facilities.

B. Notification of OWNER and authorities.

C. Coordination and preparation.

D. Protection of facilities.

E. Relocation of facilities.

F. Protection of sewer and storm drains.

G. Protection of water mains near sewers.

H. Abandonment of utilities.

I. Restoration of property markers.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

3.01. LOCATION OF FACILITIES

A. Prior to demolition, verify location of existing underground facilities near or adjacent to project.

1. Consult with OWNER and appropriate Underground Facilities Protection Organization (UFPO) and arrange for field stake-out or other markings to show locations.

2. Perform exploratory excavation at key junctures and other critical points to aid in ascertaining locations.

B. Report field stake-out findings and results of exploratory excavations to ENGINEER if possible changes in project location or design are indicated because of suspected interferences with existing facilities. Allow ENGINEER sufficient time to determine magnitude of changes and to formulate instructions in that regard.

C. If location of an existing underground facility is uncertain, apply careful excavation and probing techniques during construction to locate and avoid damage to same.

3.02. NOTIFICATION OF OWNERS AND AUTHORITIES

A. Prior to demolition, notify OWNER of existing facilities, including local Police and Fire Departments, of general scope, nature and planned progress schedule of the Work.

B. Notify owners of nearby underground facilities when excavating is to take place in a particular area, allowing them reasonable time to institute precautionary procedures or preventive measures, which they deem necessary for protection of their facilities.

C. When existing utilities, such as sewer, water, gas, telephone or electric power are damaged or disturbed during demolition, immediately notify affected Owner and Project OWNER.

D. Notify Police and Fire Departments, including affected owners, immediately if hazardous conditions are created or have the potential for occurring, as a result of damage to an existing facility or as a result of other activities at project Site. Hazardous conditions could be created from: fire, explosion, escape of gas, escape of fuel oil, gasoline or industrial fluids, downed electrical wires, and disrupted underground electrical cables.

3.03. COORDINATION AND PREPARATION

A. Discuss anticipated Work schedule with local authorities and owners of utilities at preconstruction meeting, including procedures to be followed if one or more utilities are damaged or disrupted. Develop contingency plans to address CONTRACTOR's role in repair of damaged utilities.

B. Make preparations beforehand to repair and restore damaged utilities, including arrangements for standby materials and equipment to be promptly assembled at Site and utilized immediately.

C. Adjust work schedules and personnel assignments as necessary to conform to requirements of utility owner whose utility is to be temporarily interrupted during construction. Cooperate with utility owner in this regard to minimize the time of interruption.

D. Make preparations for and conform to applicable federal, state, and local regulations regarding use of proper safeguards and procedures when excavation is to take place in close proximity to existing facilities and structures.

3.04. PROTECTION OF FACILITIES

A. Plan and conduct demolition operations so that operation of existing facilities near or adjacent to the Work, including electric, telephone, sewer, water, gas or drainage utilities, are sustained insofar as the requirements of the project will permit.

B. Protect existing facilities from damage or movement through installation of adequate support systems and use of proper equipment, including application of careful excavation and backfilling techniques in sensitive areas.

C. Existing utilities and other facilities which are damaged by the CONTRACTOR's demolition operations shall be promptly repaired by CONTRACTOR to the satisfaction of the affected owner or, if he so elects, that owner will perform the repairs with his own forces. Under either arrangement, such repair work shall be done at CONTRACTOR's expense.

D. When aboveground visible facilities such as poles, wires, cables, fences, signs or structures constitute an unavoidable interference, notify ENGINEER and consult with affected owner regarding temporary removal and later restoration of the interfering item. Arrange with that owner to remove and later restore the interfering item to the satisfaction of the owner, subject to approval of the project OWNER; or, allow affected owner to perform such work with his own forces. Under either arrangement, such work shall be done at CONTRACTOR'S expense.

E. Take all necessary precautions to prevent fires at or adjacent to the Work, buildings, and other facilities. No burning of trash or debris is permitted. If permanent fire extinguishers are used, they shall be recharged and in "new" condition when turned over to OWNER.

3.05. RELOCATION OF FACILITIES

A. If the location or position of an existing gas or water pipe, public or private sewer or drain, conduit or structure be such as, in the opinion of ENGINEER, to require its removal, realignment or change, such alteration shall be without cost to the CONTRACTOR for the Work of removal, realignment or change only.

B. Uncovering, supporting and sustaining such facility before its removal or before and after its realignment or change shall be the CONTRACTOR's responsibility as part of the Work of his Contract.

C. CONTRACTOR shall be entitled to extension of time for completion of entire Work as the ENGINEER determines that the entire Work was delayed by the removal, realignment or change of such obstruction.

3.06. PROTECTION OF SEWERS AND STORM DRAINS

A. Where existing sanitary sewers or storm drain systems are being replaced or interrupted, provide temporary bypass pumping or piping to maintain flow around that segment of the Work such that no back-ups occur in existing systems.

B. Existing sanitary sewer laterals damaged in the work or temporarily disconnected shall be restored to operation by the end of each work day. Existing sanitary sewer laterals crossing over new pipelines to be restored in accordance with details shown on the Drawings.

C. Maintain existing manholes, catch basins, and other utility structures in their pre-work condition. Any material or debris entering same due to the CONTRACTOR'S operation shall be promptly removed.

3.07. PROTECTION OF WATER MAINS NEAR SEWERS

A. Where a minimum 10-foot horizontal separation or minimum 18 inch vertical separation (bottom of water pipe to top of sewer pipe) cannot be maintained between a water main and sewer line, the sewer line shall be constructed of material conforming to AWWA/ANSI C600-82 and shall be pressure tested to a minimum of 30 psi. In addition, the following remedies shall be incorporated in the work if requested by the ENGINEER:

1. The sewer lines shall be encased in 4,000 psi mix concrete for a length of 10 feet on either side of the water main.

2. Both the water main and sewer line shall be pressure tested to 100 psi to assure water-tightness.

3. One full length of water main shall be centered over the sewer line, so that both joints will be as far from the sewer as possible.

4. Relocate water main to obtain 18-inches minimum vertical separation.

3.08. ABANDONMENT OF UTILITIES

A. Remove existing utilities to be abandoned within limits of trench excavation, or impinging on trench limits.

B. Open ends of abandoned utilities, or those scheduled for abandonment, shall be bulkheaded by cast iron plugs or caps.

C. Abandoned manholes and water valve casings shall be backfilled to grade with approved trench backfill material.

D. Frames, covers, grates, water valve casing, sections of water piping, hydrants (including standpipe and boot) valves and other items to be abandoned shall, if ordered by OWNER, be salvaged for reuse and be delivered to OWNER's property yard.

3.09. RESTORATION OF PROPERTY MARKERS

A. Property corner markers, boundary monuments, etc., disturbed or moved by the CONTRACTOR's operation shall be restored, in conformance with the property deed description, by a licensed land surveyor. Restoration of the property corner markers or boundary monuments shall be certified by said surveyor on a map prepared by him which shows the work accomplished. One copy of the map shall be given to the property owner and one copy given to the project OWNER.

END OF SECTION

SECTION 02222

EXCAVATION

PART 1 GENERAL

1.01. SUMMARY

A. Section Includes: Requirements for performing open cut excavations to the widths and depths necessary for demolition of structures, pipelines and conduits including excavation of any material necessary for any purpose pertinent to the Work.

B. Related Sections

1. Section 02161 – Shoring, Sheeting and Bracing

2. Section 02223 – Backfilling

1.02. DEFINITIONS

A. Earth: "Earth" includes all materials which, in the opinion of the ENGINEER, do not require blasting, barring, wedging or special impact tools for their removal from their original beds, and removal of which can be completed using standard excavating equipment. Specifically excluded are all ledge and bedrock and boulders or pieces of masonry larger than one cubic yard in volume.

B. Rock: "Rock" includes all materials, which, in the opinion of the ENGINEER, require blasting, barring, wedging and/or special impact tools such as jackhammers, sledges, chisels, or similar devices specifically designed for use in cutting or breaking rock for removal from their original beds and which have compressive strengths in their natural undisturbed state in excess of 300 psi. Boulders or masonry larger than one cubic yard in volume are classed as rock excavation.

1.03. SUBMITTALS

A. General: Provide all submittals, including the following, as specified in Division 01.

B. Dewatering Excavation Plan: Develop an excavation dewatering plan that considers site ground and groundwater conditions, the type and arrangement of the equipment to be used and the proper method of groundwater disposal. Prepare the dewatering plan before beginning excavations below groundwater. Maintain one copy of the dewatering plan at the project site to be available for inspection while all dewatering operations are underway.

1.04. SITE CONDITIONS

A. Actual Conditions: Make any geotechnical investigations deemed necessary to determine actual site conditions.

B. Underground Utilities: Locate and identify all existing underground utilities prior to the commencement of Work.

C. Quality and Quantity: Make any other investigations and determinations necessary to determine the quality and quantities of earth and rock and the methods to be used to excavate these materials.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

3.01. GENERAL

A. Clearing: Clear opencut excavation sites of obstructions preparatory to excavation. Clearing includes removal and disposal of vegetation, trees, stumps, roots and bushes, except those specified to be protected during trench excavation.

B. Banks: Shore or slope banks to the angle of repose to prevent slides or cave-ins.

C. Safety: Whenever an excavation site or trench is left unattended by the CONTRACTOR or when an area is not within 100 feet of observation by the CONTRACTOR, the excavation site or trench shall be filled and/or, at the OWNER's discretion, protected by other means to prevent accidental or unauthorized entry. Such protection shall include barricades and other protection devices requested by the ENGINEER or OWNER, including temporary fencing, snow fencing, or temporary "structure" tape. Such safety items shall not relieve the CONTRACTOR of any site safety requirements or liabilities established by Federal, State and local laws and agencies, including OSHA, but is intended as additional safety measures to protect the general public.

D. Hazardous Materials: If encountered, take care of hazardous materials not specifically shown or noted.

E. During excavation and any site work, storm water pollution prevention measures shall be taken to ensure that water quality criteria are not violated in the receiving water body and all state and local regulatory requirements are met.

3.02. STRUCTURE EXCAVATION

A. Excavation Size: Provide excavations of sufficient size and only of sufficient size to permit the Work to be economically and properly performed in the manner and of the size specified.

B. Compaction: Before placing backfill, proof roll the bottom of the excavations to detect soft spots.

1. For accessible areas, proof roll with a ten wheel tandem axle dump truck loaded to at least 15 tons or similarly loaded construction equipment.

2. For small areas, proof roll with a smooth-faced steel roller filled with water or sand, or compact with a mechanical tamper.

3. Make one complete coverage, with overlap, of the area.

4. Overexcavate soft zones and replace with compacted select fill.

3.03. TRENCH EXCAVATION

A. Preparation: Properly brace and protect trees, shrubs, poles and other structures which are to be preserved. Unless shown or specified otherwise, preserve all trees and large shrubs. Hold damage to the root structure to a minimum. Small shrubs may be preserved or replaced with equivalent specimens.

B. Adequate Space: Keep the width of trenches to a minimum, however provide adequate space for workers.

1. In sheeted trenches, measure the clear width of the trench at the level of the top of the pipe to the inside of the sheeting.

C. Unstable or Unsuitable Materials: If unstable or unsuitable material is exposed at the level of the bottom of the trench excavation, excavate the material in accordance with the subsection headed "Authorized Additional Excavation".

1. Material shall be removed for the full width of the trench and to the depth required to reach suitable foundation material.

2. When in the judgment of the ENGINEER the unstable or unsuitable material extends to an excessive depth, the ENGINEER may advise, in writing, the need for stabilization of the trench bottom with additional select fill material, crushed stone, washed shell, gravel mat or the need to provide firm support.

3. Crushed stone, washed shell and gravel shall be as specified in Section 02223 – Backfilling.

4. Payment for such trench stabilization will be made under the appropriate Contract Items or where no such items exist, as a change in the Work.

D. Provide ladders for a means of exit from the trench as required by applicable safety and health regulations.

E. Excavated Material: Excavated material to be used for backfill shall be neatly deposited at the sides of the trenches where space is available. Where stockpiling of excavated material is required, the Contractor shall be responsible for obtaining the sites to be used and shall maintain his operations to provide for natural drainage and not present an unsightly appearance.

F. Water: Allow no water to rise in the trench excavation until sufficient backfill has been placed.

3.04. FINISHED EXCAVATION

A. Finish: Provide a reasonably smooth finished surface for all excavations, which is uniformly compacted and free from irregular surface changes.

B. Finish Methods: Provide a degree of finish which is ordinarily obtainable from blade-grade operations, except as otherwise specified in Section 02223 – Backfilling.

3.05. PROTECTION

A. Traffic and Erosion: Protect newly graded areas from traffic and from erosion.

B. Repair: Repair any settlement or washing away that may occur from any cause, prior to acceptance. Re-establish grades to the required elevations and slopes.

C. It shall be the CONTRACTOR’s responsibility to acquaint himself with all existing conditions and to locate all structures and utilities in order to avoid conflicts. Where actual conflicts are unavoidable, work shall be coordinated with the facility owner and performed so as to cause as little interference as possible with the service rendered by the facility disturbed. Facilities or structures damaged in the prosecution of the Work shall be repaired and/or replaced immediately, in conformance with current standard practices of the industry, or according to the direction of the owner of such facility, at the CONTRACTOR’s expense.

D. Other Requirements: Conduct all Work in accordance with the environmental protection requirements specified in Division 01.

3.06. AUTHORIZED ADDITIONAL EXCAVATION

A. Additional Excavation: Carry the excavation to such additional depth and width as authorized in writing, for the following reasons:

1. In case the materials encountered at the elevations shown are not suitable.

2. In case it is found desirable or necessary to go to an additional depth, or to an additional depth and width.

B. Refill Materials: Refill such excavated space with either authorized 2500 psi concrete or compacted select fill material, in compliance with the applicable provisions of Section 02223 – Backfilling.

C. Compaction: Where necessary, compact fill materials to avoid future settlement. As a minimum, unless otherwise specified or directed, backfill layers shall not exceed 6- inches in thickness for the full trench width and compaction shall equal 95% of maximum density, or 98% if under paved area of roadway, as determined by using ASTM D 1557. Compaction density tests shall be made at all such backfill areas with spacing not to exceed 100 feet apart and on each 6-inch compacted layer.

D. Payment: Additional earth excavations so authorized and concrete or select fill materials authorized for filling such additional excavation and compaction of select fill materials will be paid for under the appropriate Contract Items or where no such items exist, as a change in the Work.

3.07. SEGREGATION STORAGE AND DISPOSAL OF MATERIAL

A. Stockpiling Suitable Materials: Stockpile topsoil suitable for final grading and landscaping and excavated material suitable for backfilling or embankments separately on the site in approved locations.

B. Stockpile Locations: Store excavated and other material a sufficient distance away from the edge of any excavation to prevent its falling or sliding back into the excavation and to prevent collapse of the wall of the excavation. Provide not less than 2 feet clear space between the top of any stockpile and other material and the edge of any excavation.

C. Excess Materials: CONTRACTOR shall be responsible to transport and dispose of surplus excavated material and excavated material unsuitable for backfilling or embankments at an offsite disposal location secured by the CONTRACTOR.

3.08. REMOVAL OF WATER

A. Water Removal: At all times during the excavation period and until completion and acceptance of the Work at final inspection, provide ample means and equipment with which to remove promptly and dispose of properly all water entering any excavation or other parts of the Work.

B. Dry Excavations: Keep the excavation dry.

C. Water Contact: Allow no water to rise over or come in contact with concrete until the concrete has attained a set and, in any event, not sooner than 12 hours after placing the concrete.

D. Discharge of Water: Dispose of water pumped or drained from the Work in a safe and suitable manner without damage to adjacent property or streets or to other work.

E. Protection: Provide adequate protection for water discharged onto streets. Protect the street surface at the point of discharge.

F. Sanitary Sewers: Discharge no water into sanitary sewers.

G. Storm Sewers: Discharge no water containing settleable solids into storm sewers.

H. Repair: Promptly repair any and all damage caused by dewatering the Work.

END OF SECTION

SECTION 02223

BACKFILLING

PART 1 GENERAL

1.01. SUMMARY

A. General Requirements: Backfill all excavation to the original surface of the ground or to such other grades as may be shown or required. Remove from all backfill, any compressible, putrescible, or destructible rubbish and refuse and all lumber and braces from the excavated space before backfilling is started. Leave sheeting and bracing in place or remove as the work progresses.

B. Related Sections

1. Section 02222 – Excavation

1.02. REFERENCES

A. Codes and standards referred to in this Section are:

1. ASTM D1557 – Standard Test Methods for Moisture-Density Relations of Soil and Soil-Aggregate Mixtures Using 10 lb Rammer and 18 in Drop

PART 2 PRODUCTS

2.01. BACKFILL MATERIAL – GENERAL

A. General: Backfill with sound materials, free from waste, organic matter, rubbish, boggy or other unsuitable materials.

B. General Materials Requirements: Conform materials used for backfilling to the requirements specified. Follow common fill requirements whenever drainage or select fill is not specified. Determine and obtain the approval of the appropriate test method where more than one compaction test method is specified.

C. Frozen Materials: Do not use frozen material for backfilling.

2.02. DRAINAGE FILL

A. Materials for Drainage Fill: Use clean gravel, crushed stone, or other suitable material conforming to the gradation specified for drainage fill. Clay and fine particles are unacceptable in drainage fill. Provide drainage fill of a grade between the following limits.

U.S. STANDARD SIEVE	PERCENT PASSING BY WEIGHT
1-1/2 inch	100
1 inch	95-100
1/2 inch	45-65
#4	5-15
#16	0-4

2.03. SELECT FILL

A. Materials for Select Fill: Use clean gravel, crushed stone, washed shell, or other granular or similar material as approved which can be readily and thoroughly compacted to 95 percent of the maximum dry density obtainable by ASTM D 1557.

1. Acceptable Materials: Grade select fill between the following limits:

U.S. STANDARD SIEVE	PERCENT PASSING BY WEIGHT
2 inch	100
1-1/2 inch	90-100
1 inch	75-95
1/2 inch	45-70
#4	25-50
#10	15-40
#200	5-15

2. Unacceptable Materials: Very fine sand, uniformly graded sands and gravels, sand and silt, soft earth, or other materials that have a tendency to flow under pressure when wet are unacceptable as select fill.

2.04. COMMON FILL

A. Materials for Common Fill: Material from on-site excavation may be used as common fill provided that it can be readily compacted to 90 percent of the maximum dry density obtainable by ASTM D 1557, and does not contain unsuitable material. Select fill may be used as common fill at no change in the Contract Price.

B. Granular Materials On-Site: Granular on-site material, which is fairly well graded between the following limits may be used as granular common fill:

U.S. STANDARD SIEVE	PERCENT PASSING BY WEIGHT
3 inch	100
#10	50-100
#60	20-90
#200	0-20

C. Cohesive Materials On-Site: Cohesive site material may be used as common fill.

1. The gradation requirements do not apply to cohesive common fill.

2. Use material having a liquid limit less than or equal to 40 and a plasticity index less than or equal to 20.

D. Material Approval: All material used as common fill is subject to approval. If there is insufficient on-site material, import whatever additional off-site material is required which conforms to the specifications and at no additional cost.

2.05 FLOWABLE FILL

A. Flowable fill shall be in accordance with FDOT Section 121 – Flowable Fill.

B. Furnish and place flowable fill as an alternative to compacted soil as approved by the ENGINEER. Applications for conventional flowable fill include encasements, closures for tanks and pipes, and general backfill for trenches, embankments and walls.

C. Acceptable Materials

Material	Standard
Fine Aggregate	FDOT Section 902
Portland Cement	FDOT Section 921
Water	FDOT Section 923
Admixtures	FDOT Section 924
Ground Tire Rubber (GTR)	FDOT Section 919
Supplementary Cementitious Materials	FDOT Section 929
Preformed Foam	ASTM C869

D. Mix Design

1. Conventional flowable fill is a mixture of portland cement, fly ash, fine aggregate, admixture and water. Flowable fill contains a low cementitious content for reduced strength development. Cellular concrete flowable fill is a low density concrete made with cement, water and preformed foam to form a hardened closed cell foam material. Cellular concrete flowable fill may also contain fine aggregate, supplementary cementitious materials and admixtures.

2. Submit mix designs for Approval. The following are suggested mix guides for excavatable and non-excavatable flowable fill:

Material	Excavatable	Non-Excavatable
Cement	75-100 lb/yd^3	75-150 lb/yd^3
Supplementary Cementitious Materials	None	150-600 lb/yd^3
Water	*	*
Air	5-35%	5-15%
28 Day Compressive Strength	Maximum 100 psi	Minimum 125 psi
Unit Weight	90-110 lb/ft^3	100-125 lb/ft^3
Fine Aggregate	**	**

*Mix designs shall produce a consistency that will result in a flowable self-leveling product at time of placement.

**Fine aggregate shall be proportioned to yield 1 yd^3

PART 3 EXECUTION

3.01. COMPACTION EQUIPMENT

A. Equipment and Methods: Carry out all compaction with suitable approved equipment and methods.

1. Compact clay and other cohesive material with sheep's-foot rollers or similar equipment where practicable. Use hand held pneumatic tampers elsewhere for compaction of cohesive fill material.

2. Compact low cohesive soils with pneumatic-tire rollers or large vibratory equipment where practicable. Use small vibratory equipment elsewhere for compaction of cohesionless fill material.

3. Do not use heavy compaction equipment over pipelines or other structures, unless the depth of fill is sufficient to adequately distribute the load.

3.02. BORROW

A. Should there be insufficient material from the excavations to meet the requirements for fill material, borrow shall be obtained from pits secured and tested by the CONTRACTOR and approved by the OWNER. Copies of all test results shall be submitted to the OWNER.

3.03. FINISH GRADING

A. Final Contours: Perform finish grading in accordance with the completed contour elevations and grades shown and blend into conformation with remaining natural ground surfaces.

1. Leave all finished grading surfaces smooth and firm to drain.

2. Bring finish grades to elevations within plus or minus 0.10 foot of elevations or contours shown.

B. Surface Drainage: Perform grading outside of building or structure lines in a manner to prevent accumulation of water within the area. Where necessary or where shown, extend finish grading to ensure that water will be carried to drainage ditches, and the site area left smooth and free from depressions holding water.

3.04. RESPONSIBILITY FOR AFTERSETTLEMENT

A. Aftersettlement Responsibility: Take responsibility for correcting any depression which may develop in backfilled areas from settlement within one year after the work is fully completed. Provide as needed, backfill material, pavement base replacement, permanent pavement, sidewalk, curb and driveway repair or replacement, and lawn replacement, and perform the necessary reconditioning and restoration work to bring such depressed areas to proper grade as approved.

3.05. INSPECTION AND TESTING OF BACKFILLING

A. Sampling and Testing: Provide sampling, testing, and laboratory methods in accordance with the appropriate ASTM Standard Specification. Subject all backfill to these tests.

B. Compaction density tests shall be made at all such backfill areas with spacing not to exceed 100 feet apart and on each 6-inch compacted layer.

C. Correction of Work: Correct any areas of unsatisfactory compaction by removal and replacement, or by scarifying, aerating or sprinkling as needed and recompaction in place prior to placement of a new lift.

END OF SECTION

SECTION 02276

EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01. DESCRIPTION

A. The work specified in this Section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as necessary.

B. Temporary work specified in this Section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as necessary.

C. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces, which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the OWNER.

D. CONTRACTOR is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.

1.02. REFERENCE DOCUMENTS

A. South Florida Building Code and Standard Building Code

PART 2 PRODUCTS

2.01. EROSION CONTROL

A. Seeding and Sodding is specified in Section 02485 – Seeding and Sodding.

B. Netting – fabricated of material acceptable to the OWNER.

2.02. SEDIMENTATION CONTROL

A. Bales – clean, seed free cereal hay type.

B. Netting – fabricated of material acceptable to the OWNER.

C. Filter Stone – crushed stone conforming to Florida Department of Transportation specifications.

D. Concrete Block – hollow, non-load-bearing type.

E. Concrete – exterior grade not less than one inch thick.

PART 3 EXECUTION

3.01. EROSION CONTROL

A. Minimum procedures for grassing are:

1. Scarify slopes to a depth of not less than six inches and remove large clods, rock, stumps, roots larger than 1/2 inch in diameter and debris.

2. Sow seed within twenty-four (24) hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.

3. Apply mulch loosely and to a thickness of between 3/4 inch and 1-1/2 inches.

4. Apply netting over mulched areas on sloped surfaces.

5. Roll and water seeded areas in a manner, which will encourage sprouting of seeds and growing of grass. Reseed areas, which exhibit unsatisfactory growth. Backfill and seed eroded areas.

3.02. SEDIMENTATION CONTROL

A. Install and maintain silt dams, traps, barriers, and appurtenances as shown on the approved descriptions and working drawings, hay bales which deteriorate and filter stone which is dislodged shall be replaced.

3.03. PERFORMANCE

A. Should any of the temporary erosion and sediment control measures employed by the CONTRACTOR fail to produce results, which comply with the requirements of the State of Florida, CONTRACTOR shall immediately take whatever steps are necessary to correct the deficiency at his own expense.

END OF SECTION

SECTION 02485

SEEDING AND SODDING

PART 1 GENERAL

1.01. SCOPE OF WORK

A. Furnish all labor, materials, and equipment necessary to satisfactorily return all vegetative areas, which have been disturbed due to Work, to their original conditions or better.

B. Work includes furnishing and placing seed or sod, fertilizer, planting, watering, and maintenance until acceptance by the OWNER.

C. CONTRACTOR is not required to seed/sod areas that become exposed due to the removal of a structure included in the Work. Limits of seeding/sodding include existing grass areas that have been disturbed due to Work.

1.02. QUALITY ASSURANCE

A. Requirements

1. It is the intent of this specification that the CONTRACTOR is obliged to deliver a satisfactory strand of grass as specified. If necessary, the CONTRACTOR shall repeat any or all of the work, including grading, fertilizing, watering, and seeding or sodding at no additional cost to the owner until a satisfactory strand is obtained.

B. Satisfactory Strand

1. For purposes of grassing, a satisfactory strand of grass is herein defined as a full lawn cover over areas to be seeded or sodded, with grass free of weeds, alive and growing, leaving no bare spots larger than 3/4 sq. yd. within a radius of 10 ft.

PART 2 PRODUCTS

2.01. MATERIALS

A. Fertilizer

1. Fertilizer shall be of the slow-release type meeting the following minimum requirements: 12 percent nitrogen, 3 percent phosphorus, 6 percent potassium; 40 percent other available materials derived from organic sources. Fertilizer shall be uniform in composition, dry and free flowing delivered to sites in original unopened containers bearing manufacturer's statement or guarantee.

B. Grassing

1. The CONTRACTOR shall grass all unpaved areas disturbed during construction which do not require sod. All grassing shall be completed in conformance with FDOT Specifications Sections 570 and 981. The grassed areas shall be mulched and fertilized in accordance with FDOT Specifications.

C. Sodding

1. Sod shall be provided as required in accordance with Florida Department of Transportation Specifications 575 and 981. The CONTRACTOR shall furnish sod equal to and similar in type as that disturbed. Placement and watering requirements shall be in accordance with FDOT Specifications Section 575.

D. Topsoil

1. Topsoil stockpiled during excavation may be used. If additional topsoil is required to replace topsoil removed during construction, it shall be obtained off site at no additional cost to the OWNERr. Topsoil shall be fertile, natural surface soil, capable of producing all trees, plants, and grassing specified herein.

E. Mulch

1. Mulch shall be fresh cypress mulch. Rate of application specified herein shall correspond to depth not less than 1" or more than 3" according to texture and moisture content of much material.

F. Water

1. It is the CONTRACTOR's responsibility to supply all water to the site, as required during seeding and sodding operations and through the maintenance period and until the work is accepted. The CONTRACTOR shall make whatever arrangements may be necessary to ensure an adequate supply of water to meet the needs for his work. He shall also furnish all necessary hose, equipment, attachments, and accessories for the adequate irrigation of lawns and planted areas as may be required. Water shall be suitable for irrigation and free from ingredients harmful to plant life.

PART 3 EXECUTION

3.01. INSTALLATION

A. Time of Seeding and Sodding

1. When the trench backfill has stabilized sufficiently, the CONTRACTOR shall commence work on lawns and grassed areas, including fine grading as required.

B. Finish Grading

1. Areas to be seeded or sodded shall be finish graded, raked, and debris removed. Soft spots and uneven grades shall be eliminated; the ENGINEER shall approve the finish grade of all areas to be seeded or sodded prior to application of seed or sod.

C. Protection

1. Seeded and sodded areas shall be protected against the traffic or other use by placing warning signs or erecting barricades as necessary. Any areas damaged prior to actual acceptance by the OWNER shall be repaired by the CONTRACTOR as directed by the ENGINEER.

3.02. CLEANUP

A. Soil, mulch, seed, or similar materials spilled onto paved areas shall be removed promptly, keeping those areas as clean as possible at all times. Upon completion of seeding and sodding operations, all excess soil, stones, and debris remaining shall be removed from the construction areas.

3.03. LANDSCAPE MAINTENANCE

A. Any existing landscape items damaged or altered during demolition by the CONTRACTOR shall be restored or replaced as directed by the ENGINEER.

B. Maintain landscape work for a period of 90 days immediately following complete installation of work or until OWNER accepts project. Watering, seeding, cultivating, restoration of grade, mowing and trimming grass, protection from insects and diseases, fertilizing and similar operations as needed to ensure normal growth and good health for live plant material shall be the responsibility of the CONTRACTOR and at no additional cost to the OWNER.

3.04. REPAIRS TO LAWN AREAS DISTURBED BY CONTRACTOR'S OPERATIONS

A. Lawn areas planted under this Contract and all lawn areas damaged by the CONTRACTOR's operation shall be repaired at once by proper soil preparation, fertilizing, and reseeding or sodding, in accordance with these Specifications.

END OF SECTION

SECTION 02530

GROUNDWATER CONTROL FOR OPEN CUT EXCAVATION

PART 1 GENERAL

1.01. DESCRIPTION OF WORK

A. This section provides for furnishing all labor, materials, equipment, power and incidentals for performing all operations necessary to dewater, depressurize, drain and maintain excavations as described herein and as necessary for removal of pipes and structures. Included are installing, maintaining, operating and removing dewatering systems and other approved devices for the control of surface and groundwater during the open cut excavations, and protecting Work against rising waters and repair of any resulting damage.

1.02. CONTRACTOR'S RESPONSIBILITY

A. It is the sole responsibility of the CONTRACTOR to identify groundwater conditions and to provide any and all labor, material, equipment, techniques and methods to lower, control and handle the groundwater as necessary for his construction methods and to monitor the effectiveness of this installed system and its effect on adjacent facilities.

B. Operate, maintain and modify the system(s) as required to conform to these Specifications. Upon completion of the Work, CONTRACTOR shall remove the system(s). The development, drilling and abandonment of all wells used in the dewatering system shall comply with regulations of the Florida Department of Environmental Protection and the governing Water Management District.

C. Assume sole responsibility for dewatering systems and for all loss or damage resulting from partial or complete failure of protective measures and any settlement or resultant damage caused by the dewatering operation.

1.03. PLANS AND OTHER DATA TO BE SUBMITTED

A. Prior to commencement of Work, submit complete drawings, details and layouts showing the proposed dewatering plans in accordance with Section 01300 - Submittals. The submittals shall be sufficiently detailed (i.e., general arrangements, procedures to be used, etc.) to allow the ENGINEER to evaluate the proposed dewatering systems. Include the following, as required by the CONTRACTOR's proposed operation:

1. Names of equipment suppliers

2. Names of installation subcontractors

3. Plan for dewatering at access shafts and control of surface drainage

4. Plan for dewatering for cut-and-cover excavations, or otherwise controlling groundwater

5. Eductor system layout and details

6. Deep well locations and details

7. Well point system layout and details

8. Installation reports for eductors, deep wells and well points

9. Water level readings from piezometers or observation wells, and method of maintenance

10. As part of his request for approval of a dewatering system, demonstrate the adequacy of the proposed system and well point filler sand by means of a test installation.

PART 2 PRODUCTS

2.01. GENERAL

A. Select equipment including but not limited to pumps, eductors, well points and piping and other material desired.

PART 3 EXECUTION

3.01. DEWATERING EXCAVATIONS

A. Furnish, install, operate and maintain all necessary equipment for dewatering the various parts of the Work and for maintaining free of water the excavations and such other parts of the Work as required for construction operations. Dewatering system should provide for continuous operation including nights, weekends, holidays, etc. Appropriate backup shall be provided if electrical power is primary energy source for dewatering system.

B. Continue dewatering in all required areas, until the involved work is completed, including the placing and compaction of backfill materials in the dry.

C. Provide a uniform diameter for each pipe drain run constructed for dewatering. Remove the pipe drain when it has served its purpose. If removal of the pipe is impractical, provide grout connections at 50-foot intervals, and fill the pipe with clay grout or cement and sand grout when the pipe has served its purpose.

3.02. DEWATERING TRENCH

A. Removal of water may be accomplished by pumping or pumping in connection with well point installation as the particular situation may warrant.

B. If the soils encountered at the trench grade are suitable for the passage of water, without destroying the sides or utility foundation of the trench, sumps may be provided at intervals at the side of the main trench excavation. Pumps shall be used to lower the water level by taking their suction from said sumps.

3.03. REQUIREMENTS FOR EDUCTOR, WELL POINTS OR DEEP WELLS

A. Eductor, well points or deep wells, where used, must be furnished, installed and operated by a reputable CONTRACTOR regularly engaged in this business, and approved.

B. Submit the design criteria of the dewatering system and a certification that the system was designed according to that criteria.

C. Install sufficient piezometers or observation wells to show that all trench excavation in sandy material is predrained prior to excavation. Install piezometers or observation wells not less than 1 week in advance of beginning of nearest excavation.

D. Dewatering may be omitted for portions of underdrains or other trenches, only where auger borings and piezometers or observation wells show that the soil is predrained by an exterior system.

3.04. MAINTENANCE AND OBSERVATION

A. Maintenance and observation of piezometers or observation wells is the responsibility of the CONTRACTOR and shall consist of keeping them in good condition and observing and recording the elevation of the water level daily, as long as the dewatering system is in operation, and weekly thereafter until the work is completed or the piezometers or wells are removed.

B. Submit a record of the water level to the ENGINEER each day.

C. Replace damaged and destroyed piezometers or observation wells, unless otherwise accepted by the ENGINEER, with new piezometers or wells within 48 hours, at no additional cost to the County.

D. Cut off piezometers or observation wells in excavation areas, where exposed, as excavation proceeds, and continue to maintain and make observations as specified.

E. Remove, backfill or grout piezometers or observation wells inside or outside the excavation area, as approved by the ENGINEER.

3.05. DURATION OF DRAINAGE

A. In areas where concrete is to be placed, carry out the foundation drainage so that the required lowering of the water table will be effected prior to placing concrete. Keep concrete free from water to the same levels for 3 days after placing concrete.

3.06. DISCHARGE OF WATER

A. Do not discharge pumped drainage water into the sanitary sewer system or inhibit pedestrian or vehicular traffic with the groundwater control system.

B. Discharge pumped drainage water into the storm sewer system or drainage ditch by direct means (i.e., discharge hose to inlet, burying header, etc.). Monitor the discharged water to determine that soil particles are not being removed.

C. All discharge shall be in conformance with regulatory permits and if discharged into receiving waters, shall not exceed 29 N.T.U. above background in accordance with FL Rule 62-302.530, F.A.C.

3.07. REPAIR OF DAMAGE

A. Assume full responsibility for all loss and damage due to flooding, rising water or seepage resulting from dewatering operations in any part of the work. Repair any damage to partially completed work from these or other causes, including the removal of slides, repair of foundation beds and performance of any other work necessitated by lack of adequate dewatering or drainage facilities.

END OF SECTION

SECTION 02575

PAVEMENT REPAIR AND RESTORATION

PART 1 GENERAL

1.01. DESCRIPTION OF WORK

A. Furnish all labor, materials, equipment, and incidentals required and remove and replace pavements which have been damaged as a result of the Contractor's operations.

1.02. GENERAL

A. All damage, as a result of Work under this project, done to existing pavement, driveways, paved areas, curbs and gutters, sidewalks, shrubbery, grass, trees, utility poles, utility pipe lines, conduits, drains, catch basins, or stabilized areas or driveways and including all obstructions not specifically named herein, shall be repaired in a manner satisfactory to the ENGINEER. Bid prices shall include the furnishing of all labor, materials, equipment, and incidentals necessary for the cutting, repair, and restoration of the damaged areas unless pay items for specific types of repair are included in the Bid Form.

B. Keep the surface of the backfilled area of excavation in a safe condition and level with the remaining pavement until the pavement is restored in the manner specified herein. All surface irregularities that are dangerous or obstructive to traffic are to be removed. The repair shall conform to applicable OWNER or State requirements for pavement repair and as described herein.

C. All materials and workmanship shall be first class and nothing herein shall be construed as to relieve the CONTRACTOR from this responsibility. The OWNER reserves the right to require soil bearing or loading tests or materials tests, should the adequacy of the foundation or the quality of materials used be questionable. Costs of these tests shall be borne by the OWNER, if found acceptable; the costs of all failed tests shall be borne by the CONTRACTOR.

D. All street and road repair shall be made in accordance with the details indicated on the drawings and in accordance with the applicable requirements of these Specifications and meeting the permit requirements and approval of the governing Department of Transportation agencies.

E. Pavement or roadway surfaces cut or damaged shall be replaced by the CONTRACTOR in equal or better condition than the original, including stabilization, base course, surface course, curb and gutter or other appurtenances. The CONTRACTOR shall obtain the necessary permits prior to any roadway work. Additionally, the CONTRACTOR shall provide advance notice to the appropriate authority, as required, prior to construction operations.

1.03. QUALITY ASSURANCE

A. Applicable provisions of the latest version of the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", and Supplemental Specifications hereunder govern the work under this Section. The Florida Department of Transportation will hereafter be referred to as FDOT.

PART 2 PRODUCTS

2.01. MATERIALS

A. All materials utilized in flexible base pavement and base course shall be as specified in the latest version of the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction".

PART 3 EXECUTION

3.01. CUTTING PAVEMENT

A. Cut and remove pavement as necessary for removing pipelines and appurtenances and for making disconnections on existing pipelines.

B. Before removing pavement, the pavement shall be marked for cuts nearly paralleling pipelines and existing street lines. Asphalt pavement shall be cut along the markings with a jackhammer, rotary saw, or other suitable tool, leaving a uniform and straight edge with minimum disturbance to the remaining adjacent surface.

C. No pavement shall be machine pulled until completely broken and separated along the marked cuts.

D. The pavement adjacent to pipeline trenches shall neither be disturbed nor damaged. If the adjacent pavement is disturbed or damaged, irrespective of cause, remove the damaged pavement and shall replace it at his own expense.

3.02. GENERAL RESTORATION

A. The restoration of existing street paving, driveways, etc., shall be restored, replaced or rebuilt using the same type of construction as was in the original. Be responsible for restoring all such work, including sub-grade and base courses where present. Obtain and pay for such local or other governmental permits as may be necessary for the opening of streets. Meet any requirements other than those herein set forth which may effect the type, quality and manner of carrying on the restoration of surfaces by reason of jurisdiction of such governmental bodies.

B. In all cases, maintain, without additional compensation, all permanent replacement of street paving, done by him under this Contract until accepted by the OWNER, including the removal and replacement of such work wherever surface depressions or underlying cavities result from settlement of backfill.

C. Complete all the final resurfacing or re-paving of streets or roads, over the excavations and relay paving surfaces of roadbed that have failed or been damaged prior to acceptance by the OWNER. Backfilling of excavations and the preparation of sub-grades shall conform to the requirements of Section 02223 – Backfilling.

3.03. PRIME AND TACK COATS

A. The work shall consist of the application of bituminous prime and tack coats on the previously prepared base course in accordance with Section 300 of the FDOT Specifications.

3.04. WEARING COURSE

A. The work shall consist of the construction of plant-mixed hot bituminous pavement to the thickness indicated in the Drawings conforming to Type III asphaltic concrete in accordance with Section 333 of the FDOT Specifications. The requirements for plant and equipment are specified in Section 320 and the general construction requirements for asphaltic concrete pavement are contained in Section 330 of the FDOT specifications.

3.05. TESTING

A. All field testing shall be performed by an independent laboratory employed by the OWNER. All materials shall be tested and certified by the producer. Tests repeated because sub-grade or base does not meet specified compaction shall be at the CONTRACTOR's expense.

3.06. MISCELLANEOUS RESTORATION

A. Sidewalks cut or damaged by construction shall be restored in full sections or blocks to a minimum thickness of four inches. Concrete curb or curb gutter shall be restored to the existing height and cross section in full sections or lengths between joints. Concrete shall be as specified on the Drawings. Grassed yards, shoulders and parkways shall be restored to match the existing sections with grass seed or sod of a type matching the existing grass.

3.07. CLEANUP

A. After all repair and restoration or paving has been completed, all excess asphalt, dirt, and other debris shall be removed from the roadways. All existing storm sewers and inlets shall be checked and cleaned of any construction debris.

END OF SECTION

SECTION 02621

BURIED POLYVINYL CHLORIDE (PVC) SEWER AND PRESSURE PIPE

PART 1 GENERAL

1.01. SUMMARY

A. Section Includes: Requirements for providing buried PVC pipe, fittings and appurtenances.

1. Provide PVC pipe and fittings complete with all necessary jointing facilities and materials, specials, adapters and other appurtenances required for installation in and completion of the pipelines to be constructed.

2. Provide plain end or rubber gaskets (push-on or mechanical joint) of the types, sizes and classes shown or specified.

B. Related Sections

1. Section 02630 – Ductile-Iron Pipe and Fittings

1.02. REFERENCES

A. Codes and standards referred to in this Section are:

1. ASTM D 3034 – Type PSM Vinyl Poly Chloride (PVC) Sewer Pipe and Fittings

2. ASTM F679 – Vinyl Poly Chloride (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings

3. AWWA C900 – Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. through 12 In., for Water Distribution

4. AWWA C905 – Polyvinyl chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 In. through 36 In.

5. ASTM D2321 – Underground Installation of Flexible Thermoplastic Sewer Pipe

6. ASTM F477 – Elastomeric Seals (Gaskets) For Joining Plastic Pipe

7. ANSI A21.10 – Ductile-Iron and Gray-Iron Fittings 3 inches through 48 inches, for Water and Other Liquids

8. ANSI A21.11 – Rubber-Gasket Joints for Ductile-Iron and Gray Iron Pressure Pipe and Fittings

1.03. SYSTEM DESCRIPTION

A. Design Standards:

1. Provide 4-inch through 15-inch PVC gravity sewer pipe and fittings meeting the requirements of ASTM D 3034.

2. Provide 18-inch through 27-inch PVC gravity sewer pipe and fittings meeting the requirements of ASTM F 679.

3. Provide 4-inch through 12-inch PVC pressure pipe meeting the requirements of ANSI/AWWA C900.

4. Provide 14-inch through 36-inch PVC pressure pipe meeting the requirements of ANSI/AWWA C905.

5. Provide pipe of the various sizes and classes as specified in the schedule or shown. Restrain all pressure pipe joints.

6. Construct concrete encasements where shown.

1.04. SUBMITTALS

A. General: Provide all submittals, including the following, as specified in Division 01.

B. Submit the following shop drawings:

1. Pipe joints, fittings, sleeves and cleanouts. Where special designs or fittings are required, show the work in large detail and completely describe and dimension all items.

2. Fully dimensioned drawings of piping layouts, including fittings, couplings, sleeves, cleanouts, valves, supports and anchors. Label pipe size, materials, type, and class on drawings and include the limits of each reach of restrained joints. Provide cross sections showing elevations of cleanouts, pipes, fittings, sleeves, and valves.

3. Catalog data for pipe, joints, fittings, sleeves, harnessing and cleanouts.

C. Quality Control: Submit certificate of compliance for pipe, fittings, gaskets, coatings, specials, sleeves and cleanouts in accordance with this Section.

1.05. DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle all pipe, fittings and appurtenances as specified in Division 01.

PART 2 PRODUCTS

2.01. MATERIALS

A. Fittings for Pressure Pipe: Provide all fittings meeting the requirements of ANSI A21.10, unless shown or specified otherwise. Provide fittings with cement mortar lining. Fittings 14 inches and larger require a pressure rating of 150 psi, or as specified, whichever is greater.

B. Joints Fittings for Gravity Sewer Pipe: Provide all fittings meeting the requirements of ASTM D 3034 and ASTM F 679. Provide joints that are a molded integral part of the pipe section. Do not use joints or couplings furnished loose. Provide joints with elastomeric gasket joints.

C. Joints for Pressure Pipe: Provide pipe with bell ends in accordance with AWWA C900 and AWWA C905. Provide joints with elastomeric gasket joints.

D. Elastomeric Gasket Joints: Provide elastomeric gasket joints in accordance with ASTM F 477.

E. Rubber Gasket Joints: Provide mechanical joints meeting the requirements of ANSI A21.11.

F. Harnessing: Series 1600, Series 2800 and Series 2000 PV as manufactured by EBAA Iron Sales, Inc., or equal.

G. Color: Provide pipe made of 100 percent of the color specified. Provide green sewer pipe. Provide blue potable water pipe. Provide pantone purple for reuse water pipe.

H. Pressure Pipe Outside Diameter: Provide pressure pipe of the outside diameter consistent with ductile-iron pipe.

I. Pipe Marking: Provide mark on each pipe at internals of 5 feet or less to designate compliance with applicable ASTM or AWWA specification.

J. Temporary Bulkheads: Provide temporary bulkheads at the ends of sections where adjoining pipelines have not been completed and are not ready to connect.

1. Remove all temporary bulkheads when they are no longer needed.

K. Date of Manufacturer: Provide pipe and fittings manufactured no earlier than 12 month period proceeding the date of the Agreement.

L. Wall Thickness for Gravity Sewer:

1. 4 through 15 inches diameter - provide SDR-35 conforming to ASTM D 3034 for depth of cuts through 18 feet. Provide SDR-26 conforming to ASTM D 3034 for depth of cut over 18 feet.

2. 18 through 27 inches diameter - provide either T-1 or T-2 conforming to Table 1 in ASTM F 679.

PART 3 EXECUTION

3.01. INSTALLATION

A. Install all buried PVC pipe and fittings in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 01.

3.02. LEAKAGE TESTING

A. Cleaning: Flush clean and test all pipes after installation.

B. Testing: Test pipes for leaks and repair or tighten as required

3.03. DISINFECTION

A. General: Disinfect all pipelines that are to carry potable water before they are placed in service.

END OF SECTION

SECTION 02623

POLYVINYL CHLORIDE (PVC) WATER MAIN PIPE

PART 1 GENERAL

1.01. SCOPE OF WORK

A. Furnish all labor, materials, equipment, and incidentals required, and install polyvinyl chloride (PVC) waterline, fittings, service connections and appurtenances as shown on the Drawings and as specified herein.

B. All water mains less than or equal to 12 inches in diameter shall be constructed of PVC, unless otherwise approved by OWNER.

1.02. REFERENCES

A. The standard references the documents listed below. They form a part of this standard to the extent specified herein. In any case of conflict, the requirements of this standard shall prevail:

1. ASTM D1598 – Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure

2. ASTM D1599 – Test Method for Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings

3. ASTM D1784 – Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

4. ASTM D2122 – Standard Method of Determining dimensions of Thermoplastic Pipe and Fittings

5. ASTM D2152 – Standard Test Method for Degree of Fusion of Extruded Poly (Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion

6. ASTM D2241 – Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series)

7. ASTM D2412 – Standard Test Method for Determination of External Loading characteristics of Plastic Pipe by Parallel-Plate Loading

8. ASTM D2774 – Recommended Practice for underground Installation of Thermoplastic Pressure Piping

9. ASTM D2837 – Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials

10. ASTM D3139 – Specifications for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

11. ASTM F477 – Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

12. AWWA M23 – PVC Pipe - Design and Installation

13. NSF 14 – Plastics Piping System Components and Related Materials

1.03. SUBMITTALS

A. Submit to the Engineer within fourteen days after receipt of Notice-to-Proceed a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.

B. Submit for approval, as provided in the Supplement to the General Conditions, complete, detailed shop drawings of all PVC pipe and fittings.

C. Submit and shall comply with pipe manufacturer's recommendations for handling, storing, and installing pipe and fittings.

PART 2 PRODUCTS

2.01. WATER MAIN

A. Polyvinyl Chloride (PVC) Pipe

1. All 4-inch through 12-inch diameter PVC pipe shall be rated per AWWA, C900, DR18, Class 150. Water mains larger than 12 inches shall be constructed of Ductile Iron Pipe.

2. PCV pipe less than 4-inches in diameter shall be Schedule 80 with a pressure rating of 200 psi solvent welded, including blow-off assemblies. PVC pipe will be acceptable for pipe diameters of 12 inches or less.

3. The potable water mains shall be blue in color.

4. All pipe shall be manufactured in the United States.

B. Steel Encasement Pipe: Conform to ASTM Designation A252, Grade 2. Joints shall be welded completely around the pipe by a certified welder. Pipe shall meet all AASHTO standards and Florida DOT requirements.

C. Fittings:

1. Pipe: Fittings shall be ductile iron mechanical joint, with a working pressure of 250 psi and conforming to AWWA Specifications C110 or C153. For pipe 8 inches and smaller, fittings shall be C900 PVC rated fittings.

2. PVC fittings for 2-inch and smaller diameter pipe shall be threaded or glued and shall be Schedule 80 and conform to the requirements of ASTM D-2464. Threaded joints shall be used only with Schedule 80 pipe or stronger. At threaded joints between PVC and metal pipes, the metal shall contain a threaded socket and the PVC threaded spigot end. A metal spigot shall not, under any circumstances be screwed into a PVC socket.

3. PVC fittings 4 inches and larger in diameter shall meet the requirements of applicable AWWA C900 and C905 specifications. Fittings shall be manufactured entirely of PVC meeting ASTM D1784, shall be formed by a thermal-form process and be of one-piece construction, able to withstand 755 psi quick burst pressure-tested in accordance with ASTM D1599 and withstand 500 psi for a minimum of 1,000 hours tested in accordance with ASTM D1598. Bells shall be gasketed push on type conforming to ASTM D3139 with gaskets conforming to ASTM F477. Fittings shall be as manufactured by the Harrington Corporation, or approved equal. Cement lined ductile iron fittings with mechanical or push on joints conforming to AWWA C153 or

C110 may be approved as alternative when PVC pressure fittings of the required sizes are not available.

4. Tapping Sleeves: Sleeve shall be stainless steel, mechanical joint type, with working pressure rating of 250 PSI, and conform to AWWA Standard C110.

5. All fittings shall be manufactured in the United States.

D. Joint Restraining Devices: Restraining joints shall be placed at all bends, tees, plugs, reducers, and other fittings to provide lateral support, and shall conform to the details shown on the drawings in Section 9 of the Lee County Utilities Operations Manual. Concrete thrust blocks may be utilized as additional restraint if approved by Lee County Utilities.

1. Joint restraint devices for C-900, C905 PVC pipe used with ductile iron mechanical joint fittings shall be EBAA Iron Sales, Inc., Series 2000 PV, Uni-Flange 1300, Star Pipe Product, L.P., or approved equal.

2. Bell joint restraint devices for PVC push joint pipe shall be EBAA Iron Inc., Series 1600 for C-900 PVC pipe, Series 2800 for bell restraint on C-905 PVC pipe or Uni-Flange Series 1300, 1360 or 1390 or ROMAC Series 600, Star Pipe Products L.P., or approved equal.

3. C-900 C-905 PVC fittings shall be restrained with EBAA Iron Inc., Series 2500 bell restraint for PVC fittings, Star Pipe Products, L.P., or an approved equal.

4. Bolts and nuts shall be Ductile Iron, T-Head type with hexagonal nuts. Bolts and nuts shall be machined through and nuts shall be tapped at right angles to a smooth bearing surface.

E. Joint Design: PVC pipe 4 inches in diameter or larger shall have provisions for expansion and contraction provided in the joints. All joints shall be designed for push-on make-up connections. Push-on joint may be a coupling manufactured as an integral part of the pipe barrel consisting of a thickened section with an expanded bell with a groove to retain a rubber sealing ring of uniform cross section, similar and equal to John's Mannville ring-type and Ethyl Bell Ring or may be made with a separate twin gasketed coupling similar and equal to Certainteed Fluid-Type.

2.02. IDENTIFICATION

A. Pipe shall bear identification markings that will remain legible after normal handling, storage, and installation. Markings shall be applied in a manner that will not weaken or damage the pipe. Marking shall be applied at intervals of not more than 5 feet on the pipe. Marking on the pipe shall include the following:

1. Nominal size and OD base

2. PVC

3. Dimension ratio

4. AWWA pressure rating

5. AWWA designation

6. Manufacturer's name and trademark

7. Manufacturer's production code, including day, month, year, shift, plant, and extruder of manufacturer

8. All PVC water pipe shall be color-coded blue.

PART 3 EXECUTION

3.01. WATER MAIN INSTALLATION

A. Polyvinyl Chloride (PVC) water pipe shall be installed in accordance with the manufacturer's recommendation, as shown on the drawings, and as specified herein.

B. The Contractor shall use care in handling, storage, and installation of pipe and fittings. Storage of pipe on the job site shall be done in accordance with the pipe manufacturer's recommendation. Under no circumstances shall pipe or fittings be dropped into the trench.

C. Pipe shall be laid to lines and grade shown on the drawings with bedding and backfill as shown on the drawings. Blocking under the pipe will not be permitted.

D. When laying is not in progress, or the potential exists for dirt or debris to enter the pipe, the open ends of the pipe shall be closed with plug or by other approved means.

3.02. CLEANING

A. At the conclusion of the work, the Contractor shall thoroughly clean all of the new pipe lines by flushing with water and pigged to remove all dirt, stones, pieces of wood, or other material which may have entered during the construction period. Debris cleaned from the lines shall be removed from the job site. If, after this cleaning, any obstructions remain, they shall be removed at the Contractor's expense.

END OF SECTION

SECTION 02630

DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01. SCOPE OF WORK

A. Furnish labor, materials, equipment, and incidentals required, and install ductile iron pipe, fittings and appurtenances as shown on the Drawings and as specified herein.

B. Note: buried ductile iron pipe shall be acceptable for sanitary force main construction. All water mains larger than 12 inches shall be constructed of Ductile Iron Pipe and shall be used for all vertical deflections ditch crossings, subaqueous crossings, and all paved surfaces unless otherwise approved by OWNER.

1.02. REFERENCES

A. The standard references the documents listed below. They form a part of this standard to the extent specified herein. In any case of conflict, the requirements of this standard shall prevail:

1. ANSI/AWWA C104/A21.4 – Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

2. ANSI/AWWA C105/A21.5 – Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids

3. ANSI/AWWA C110/A21.10 – Ductile-Iron Fittings, 3 in. Through 48 Inches, for Water and Other Liquids. (C110 2-48 inches)

4. ANSI/AWWA C111/A21.11 – Rubber Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

5. ANSI/AWWA C115/A21.15 – Flanged Ductile-Iron Pipe with Threaded Flanges

6. ANSI/AWWA C150/A21.50 – Thickness Design of Ductile-Iron Pipe

7. ANSI/AWWA C151/A21.51 – Ductile-Iron Pipe, Centrifugally Cast for Water or Other Liquids

8. ANSI/AWWAC153/A21.53 – Ductile-Iron Compact Fittings, 3 inches through 16 inches, for Water and Other Liquids

9. AWWA C600 – Installation of Ductile Iron Water Mains and Their Appurtenances

10. AWWA F477 – Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Material

1.03. SUBMITTALS

A. Shop Drawings: Submit shop drawings of pipe and fittings in accordance with the requirements in the General Conditions, the requirements of the referenced standards and the following supplemental requirements as applicable:

1. Certified dimensional drawings of all valves, fittings, and appurtenances

2. For pipe 48 inches in diameter and larger, a line layout and marking diagram shall indicate the specific number and location (station) of each fitting.

3. In all cases, a line layout to indicate the limits of each reach of restrained joints, or of concrete encasement shall be supplied.

B. Certifications: Furnish a certified affidavit of compliance for all pipe and other products or materials furnished under this Section of the Specifications, which indicates that all tests have been made and that all results comply with the requirements of AWWA C151, including but not necessarily limited to the following:

1. Acceptance Tests

2. Hydrostatic Tests

3. Low Temperature Impact Tests

C. Additional Documentation: Foundry records shall be furnished in the form of written transcripts upon request.

D. All expenses incurred for certification, testing, and data submittal shall be borne by the CONTRACTOR or the Supplier.

1.04. QUALITY ASSURANCE

A. Inspection: All pipe shall be available for inspection at the place of manufacture prior to shipping in accordance with the provisions of the referenced standards. Notify the ENGINEER in writing not less than 10 calendar days prior to the shipping of the pipe.

B. The ENGINEER shall be given access to all areas where manufacturing and testing is performed and shall be permitted to make all inspections necessary to confirm manufacturer compliance with these Specifications.

C. Tests: Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with the requirements of the referenced standards as applicable.

D. Provide on material tests at no additional cost to the OWNER.

E. In addition to those tests specifically required, the ENGINEER may request additional samples of any material including lining and coating samples for testing by the OWNER. The additional samples shall be furnished at no additional cost to the OWNER.

1.05. CORROSION PROTECTION

A. The allowed force main pipe materials are polyvinyl chloride (PVC) or high density polyethylene (HDPE) or fiberglass. Use of ductile iron pipe (DIP) and DIP fittings are not allowed without the specific approval of Lee County Utilities. Where a force main is expected to flow full pipe at all times, DIP may be used after specific approval by Lee County Utilities. The DIP pipe will be required to have a Polybond Plus lining or approved equal. The Polybond Plus lining consist of a minimum of 60 mils thick polyethylene lining with a fusion bonded epoxy primer layer to the DIP pipe. This lining must extend through the bell of the pipe to a point under the sealing gasket. To ensure a holiday-free lining, documentation must be provided, prior to shipment, showing each section of the lined pipe has passed the holiday testing at production per ASTM G62 with a minimum of 10,000 volt charge.

B. If specifically approved by Lee County Utilities for use, exterior protection shall be provided for underground ductile iron pipe and fittings within areas of severe corrosive conditions. This shall be accomplished by the installation of polyethylene encasement through the area of

concern. The soil test evaluation to determine the necessity for extra protection in suspect areas shall be those set forth in ANSI Standard A21.5. Additionally, where other existing utilities are known to be cathodically protected, ductile iron pipe crossing said utility shall be protected for a distance of 20 feet to each side. If ductile iron pipe is to be installed parallel to and within 10 feet of cathodically protected pipe, then protection shall be provided for the entire length. Steel pipe shall not be installed in severe corrosion areas.

PART 2 PRODUCTS

2.01. GENERAL

A. Cement mortar lined ductile iron pipe shall conform to ANSI/AWWA C151 and C104, subject to the following supplemental requirements. The pipe shall be of the diameter and class shown, shall be furnished complete with rubber gaskets as indicated in the Contract Documents, and all specials and fittings shall be provided as required under the Contract Documents.

B. Markings: Legibly mark specials 48 inches in diameter and larger in accordance with the laying schedule and marking diagram. All fittings shall be marked at each end with top field centerline.

C. Handling and Storage: The pipe shall be handled by wide slings, padded cradles, or other devices designed and constructed to prevent damage to the pipe and its lining. The use of equipment or handling, which might injure the pipe and its lining, will not be permitted. Stockpiled pipe shall be suitably supported and shall be secured to prevent accidental rolling. All other pipe handling equipment and methods shall be acceptable to the ENGINEER.

D. Laying lengths: Maximum pipe laying lengths shall be 20 feet.

E. Finish: The pipe shall have smooth dense interior surfaces and shall be free from fractures, excessive interior surface crazing and roughness, in accordance with ANSI/AWWA C104.

F. Closures and Correction Pieces: Closures and correction pieces shall be provided as required so that closures may be made due to different headings in the pipe laying operation and so that correction may be made to adjust the pipe laying to conform to pipe stationing shown on the Drawings or line layouts where applicable.

2.02. PIPE DESIGN CRITERIA

A. General: Ductile Iron pipe shall be designed in accordance with the requirements of ANSI/AWWA C150 as applicable and as modified in this Section.

B. Pipe Wall Thickness for Internal Pressure: The pipe shall be designed with a net thickness to withstand the design internal pressure in accordance with the hoop stress formula. In addition to the requirements of the Section, the minimum wall thickness shall be in accordance with the minimum thickness wall depicted in table 50.5 of ANSI/AWWA C150.

C. Ductile Iron Pipe shall be a minimum of Class 50 or pressure Class 250 and will be accepted in any diameter for use within the water distribution system.

D. All aboveground water main pipe shall be painted blue. The pipe wall thickness shall not be less than that required by a working pressure of 250 psi in laying condition Type 4 “B” with 5-foot cover in conformance with ANSI Standard A21.50.

2.03. MATERIALS

A. Ductile Iron Pipe: Pipe materials shall conform to the requirements of ANSI/AWWA C151.

B. Cement: Cement for mortar lining shall conform to the requirements of ANSI/AWWA C104; provided that cement for mortar lining shall by Type II or V. A fly ash or pozzolan shall not be used.

C. Adapters to connect ductile iron pipe or fittings to pipe or fittings of dissimilar materials shall be supplied by the CONTRACTOR in accordance with the pipe manufacturer recommendations, and as approved by the ENGINEER.

2.04. SPECIALS AND FITTINGS

A. Fittings for ductile iron pipe shall conform to the requirements of ANSI/AWWA C153/A21.53 or ANSI/AWWA C110/A21.10 for diameters 3 inches through 48 inches and shall have a minimum pressure rating of 250 psi. Ductile iron fittings shall be cement lined, seal coated and outside coated as specified. Ductile Iron fittings larger than 48 inches shall conform to the above referenced standard with the necessary modifications for the larger size manufacturer's standard.

B. All above-ground fittings in direct contact with wastewater shall be HDPE or ductile iron flanged joints with a minimum pressure rating of 250 psi conforming to ANSI A21.10. If above-ground ductile iron fitting is used, the fitting shall be lined with Protecto 401 applied in strict accordance with the manufacturers specifications to a dry film thickness of 40 mils. All above-ground fittings shall have a factory applied exterior epoxy coating in accordance with AWWA C550.

2.05. DESIGN OF PIPE

A. General: The pipe furnished shall be ductile iron pipe, mortar-lined, with rubber gasketed joints.

B. The pipe shall be designed, manufactured, tested, inspected, and marked according to applicable requirements previously stated and except as hereinafter modified, shall conform to ANSI/AWWA C151.

C. Pipe Dimensions: The pipe shall be of the diameter and class shown. The minimum wall thickness for each pipe size shall be as specified herein or shown on the Drawings.

D. Fitting Dimensions: The fittings shall be of the diameter shown and class specified.

E. Joint Design: Ductile Iron pipe and fittings shall be furnished with mechanical joints, push-on joints and flanged joints as follows:

1. For buried pipe applications, unless otherwise indicated, mechanical and push-on joints shall conform to ANSI/AWWA C111/A21.11, with the minimum pressure rating of 250 psi.

2. For above-ground or buried vault applications, unless otherwise indicated, flanged joints shall conform to ANSI/AWWA C115/A21.15, with the minimum pressure rating of 250 psi. All above-ground fittings shall be painted blue.

F. Restraining Devices: Restraining joints shall be placed at all bends, tees, plugs, reducers, and other fittings to provide lateral support, and shall conform to the details shown on the drawings in Sections 9 of the Lee County Utilities Operations Manual. Concrete thrust blocks may be utilized as additional restraint if approved by Lee County Utilities.

1. Joint restraint devices for ductile iron mechanical joint pipe and ductile iron mechanical joint fittings to ductile iron pipe shall be EBAA Iron Inc., Series 1100 Megalug (R), Star Pipe Products, L.P., or approved equal.

2. Bell joint restraint devices for ductile iron push joint pipe shall be EBAA Iron Inc., Series 1700 Megalug (R) for bell restraint, Star Pipe Products L.P., or approved equal.

G. For bell-and-spigot ends with rubber gaskets, the clearance between the bells and spigots shall be such that when combined with the gasket groove configuration and the gasket itself will provide watertight joints under all operating conditions when properly installed. Require the pipe manufacturer to submit details complete with significant dimensions and tolerances and also to submit performance data indicating that the proposed joint has performed satisfactorily under similar conditions. In the absence of a history of field performance, the results of a test program shall be submitted.

H. Gaskets shall be a Buna N, Neoprene, or a Nitryl-based rubber product approved by the County. Gaskets shall have clean tips unless otherwise specified. Elastomeric gaskets conforming to ASTM F-477 shall also be acceptable.

I. Shop-applied interior linings and exterior coatings shall be applied evenly to the nominal thickness specified. Holiday free cement is not possible to manufacture. Exterior coatings: asphalt coating for buried pipe or primed pipe cannot be furnished holiday free.

2.06. CEMENT-MORTAR LINING

A. Cement-Mortar Lining For Shop Application: Except as otherwise provided herein, interior surfaces of all ductile iron pipe shall be cleaned and lined in the shop with cement-mortar lining applied centrifugally in conformity with ANSI/AWWA C104. Ductile-Iron pipefittings need not have the cement-mortar lining applied centrifugally. The lining machines shall be of a type that has been used successfully for similar work. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at delivery site, the damaged or unsatisfactory portions shall be repaired in the filed in accordance with ANSI/AWWA C104.

B. The nominal wet lining thickness shall be as follows:

NOMINAL FACTORY NOMINAL REPLACEMENT		
NOMINAL PIPE DIAMETER (IN.)	APPLIED LINING THICKNESS (IN.)	LINING THICKNESS (IN.)
3-12	1/8	1/8
14-24	3/16	3/16
30-64	1/4	1/4

C. Protection of Pipe Lining/Interior: All shop-applied cement mortar lining shall be given a seal coat of asphaltic material in conformance with ANSI/AWWA C104.

2.07. EXTERIOR COATING OF PIPE

A. Exterior Coating of Exposed Piping: The exterior surfaces of pipe which will be exposed to the atmosphere inside structures or above ground shall be thoroughly cleaned and then given a shop coat of rust-inhibitive primer. All above-grade pipe shall be painted to match the pipe it is being connected to.

B. Exterior Coating of Exposed Piping: The exterior surfaces of pipe which will be exposed to the atmosphere inside structures or above ground shall be thoroughly cleaned and then given a shop coat of rust-inhibitive primer.

PART 3 EXECUTION

3.01. INSTALLATION OF PIPE

A. Handling and Storage: All pipe, fittings, etc., shall be carefully handled and protected against damage, impact shocks, and free fall and in accordance with ANSI/AWWA C600. Pipe shall not be placed directly on rough rocky ground but in such instances shall be supported in a manner which will protect the pipe against injury whenever stored at such trench site or elsewhere. No pipe shall be installed where the lining or coating show defects that may be harmful as determined by the ENGINEER. Such damaged lining or coating shall be repaired, or a new undamaged pipe shall be furnished and installed.

B. All pipe damaged prior to Substantial Completion or during warrantee period shall be repaired or replaced by the CONTRACTOR.

C. Inspect each pipe and fitting prior to installation to insure that no damaged portions of the pipe get installed.

D. Before placement of pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance, which may have collected therein and shall be kept clean at all times thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the work.

E. Pipe Laying: The pipe shall be installed in accordance with ANSI/AWWA C600.

F. Pipe shall be laid directly on the bedding material. No blocking will be permitted, and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Excavations shall be made as needed to facilitate removal of handling devices after the pipe is laid. Bell holes shall be formed at the ends of the pipe to prevent point loading at the bells or couplings. Excavation shall be made as needed outside the normal trench section at field joints to permit adequate access to the joints for field connection operations and for application of coating on field joints.

G. Where necessary to raise or lower the pipe due to unforeseen obstructions or other causes, the ENGINEER may change the alignment and/or the grades. Such change shall be made by the deflection of joints, by the use of bevel adapters, or by the use of additional fittings. However, in no case shall the deflection in the joint exceed 70 percent of the maximum deflection recommended by the pipe manufacturer. No joint shall be misfit any amount which will be detrimental to the strength and water tightness of the finished joint.

H. Pipe and Specials Protection: The openings of all pipe and specials shall be protected with suitable bulkheads to prevent unauthorized access by persons, animals, water, or any undesirable substance. At all times, means shall be provided to prevent the pipe from floating.

I. Pipe Cleanup: As pipe laying progresses, keep the pipe interior free of all debris. Completely clean the interior of the pipe of all sand, dirt, mortar splatter and any other debris following completion of pipe laying, pointing of joints, and any necessary interior repairs per ANSI/AWWA C600 and C602 prior to testing and disinfecting the completed pipeline. Pipe larger than 12" diameter will utilize a polyurethane foam plug "Poly Pig" to remove all debris from main.

3.02. RUBBER GASKETED JOINTS

A. Rubber Gasketed Joints: Immediately before jointing pipe, the bell end of the pipe shall be thoroughly cleaned, and a clean rubber gasket shall be placed in the bell groove. The bell and spigot end of push-on joint pipe shall be carefully cleaned and lubricated with a vegetable-based lubricant or per manufacturer's recommendation. The spigot end of the pipe section shall then be inserted into the bell of the previously laid joint and telescoped into its proper position. Tilting of the pipe to insert the spigot into the bell will not be permitted.

3.03. INSTALLATION OF PIPE APPURTENANCES

A. Installation of Valves: All valves shall be handled in a manner to prevent any injury or damage to any part of the valve. All joints shall be thoroughly cleaned and prepared prior to installation. Adjust all stem packing and operate each valve prior to installation to insure proper operation.

B. All valves shall be installed so that the valve stems are plumb and in the location shown on the Drawings.

C. Mechanical joints consisting of bell, socket, gland, gasket, bolts, and nuts shall conform to ANSI Standard A21.11. Bolts and nuts shall be high strength, low alloy, Cor-Ten, T-Head Type having hexagonal nuts. Bolts and nuts shall be machined through and nuts shall be tapped at right angles to a smooth bearing surface. Single sealed gasket push-on type joints shall conform to the requirements of ANSI A21.11 and shall be Tyton, Fastite, Superbelltite, Alltite, or approved equal.

D. Mechanical joint retainer glands may be used to restrain mechanical joint pipe and fittings to the plain end of ductile iron pipe and fittings when used in conjunction with thrust blocks of reduced size. The Utilities ENGINEER must approve thrust block size. Joint flexibility shall be maintained.

END OF SECTION

SECTION 03000

CONCRETE

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Formwork.

B. Reinforcing steel bars and accessories.

C. Concrete mixes.

D. Concrete testing.

E. Concrete finishes.

F. Concrete curing and protection.

G. Repair to new, defective concrete.

H. Chemical adhesive system to install dowels and anchor bolts.

I. Waterstops.

J. Joint filler and sealant.

K. Bonding agent.

1.02. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Concrete Institute (ACI)

ACI 201.1	Guide for Conducting a Visual Inspection of Concrete in Service
ACI 211.1	Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 301	Specifications for Structural Concrete
ACI 302.1	Guide for Concrete Floor and Slab Construction
ACI 304	Measuring, Mixing, Transporting and Placing Concrete
ACI 305	Hot Weather Concreting
ACI 308	Guide to Curing Concrete
ACI 309	Guide for Consolidation of Concrete
ACI 315	Details and Detailing of Concrete Reinforcement
ACI 315R	Manual of Engineering and Placing Drawings for Reinforced Concrete Structures
ACI 318	Building Code Requirements for Structural Concrete
ACI 347	Recommended Practice for Concrete Formwork

ACI 350	Code Requirements for Environmental Engineering Concrete Structures

B. American Society for Testing and Materials (ASTM)

ASTM A185	Steel Welded Wire Reinforcement, Plain, for Concrete
ASTM A497	Steel Welded Wire Reinforcement, Deformed, for Concrete
ASTM A615	Deformed and Plain Billet Steel Bars for Concrete Reinforcement
ASTM C31	Making and Curing Concrete Test Specimens in the Field
ASTM C33	Concrete Aggregates
ASTM C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C88	Soundness of Aggregates
ASTM C94	Ready-Mixed Concrete
ASTM C136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Portland Cement
ASTM C172	Sampling Freshly Mixed concrete
ASTM C231	Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Air-Entraining Admixtures for Concrete
ASTM C309	Liquid Membrane Forming Compounds for Curing Concrete
ASTM C494	Chemical Admixtures for Concrete
ASTM C595	Specification for Blended Hydraulic Cements
ASTM C618	Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C989	Ground Granulated Blast-Furnace Slag for Use in Concrete

1.03. SUBMITTALS

A. Submit Concrete Mix Designs - Concrete mixes used on this project shall be either established mixes verified by “Field Test Data” or new custom laboratory designed “Trial Mixtures.” Requirements for either option are as follows.

All data shall be dated within the last 12 months. Partial submittal will not be reviewed.

1. List amount and sources of mix ingredients:

- Cement
- Pozzolans (fly ash and slag)
- Fine aggregate
- Coarse aggregate
- Water
- Admixtures (including fibers)

2. Strength Test Reports - The average strengths shall be higher than the required average compressive strengths (f’cr) as per ACI 301, paragraph 4.2.3.3.

3. Typed letter signed by an official from concrete supplier stating that all ingredients for proposed mix(es) are identical and from the same source as ingredients used for concrete in provided strength test reports.

4. Certified tests of fine and coarse aggregates meeting requirements in Part 2 of this specification.

5. Certified statement from source of fine and coarse aggregates pertaining to history of alkali-aggregate reactivity (ASR) or State DOT confirmation that ASR issues are not evident at the aggregate source.

6. Certified mill test of cement and fly ash or slag.

7. Certified test for amount of water-soluble chloride ion (CL^-) in concrete.

8. One-page admixture catalog cuts.

B. Submit one-page catalog cut for retarding admixture.

C. Submit one-page catalog cut for surface-applied hot weather evaporation reducer.

D. Submit a written statement regarding CONTRACTOR's anticipated curing procedures.

E. Reinforcing Steel - Submit shop drawings in accordance with ACI 301, ACI 315 and ACI 315R, as modified below.

1. Drawings shall be clearly drawn and show enough details to locate every bar without the need to refer to the Contract Drawings. All construction and control joints must be shown. Photocopies of Contract Drawings, in whole or in part, will not be acceptable.

2. No fabrication shall commence until shop drawings are approved. All bars shall be shop fabricated.

F. Submit catalog cut for threaded rebar splicing system.

G. Submit catalog cuts for chemical adhesive system used to install dowels and threaded anchor bolts into hardened concrete.

H. Submit catalog cuts for joint filler and sealant.

I. Submit catalog cut for bonding agent.

J. Submit catalog cuts for waterstops and waterstop accessories, clearly indicating which item(s) are to be used.

K. Submit catalog cut for curing compound with fugitive dye specifically indicated.

1.04. COORDINATION

A. Coordinate all concrete placements with Work indicated in all specifications and on all Contract Drawings.

B. Coordinate the installation of all cast-in (embedded) items prior to start of concrete placement. Post-installation of cast-in (embedded) items will not be allowed.

C. CONTRACTOR shall receive approval on anticipated curing and protection procedures prior to placement of all concrete.

D. Coordinate all concrete placements with testing and inspection requirements specified herein.

1.05. QUALITY ASSURANCE

A. The concrete batch plant providing concrete to this project shall be certified by the Florida DOT.

B. Bar Identification and Mill Test Reports - All reinforcing bars shall have the manufacturer's mill marking rolled into the bar which shall indicate the producer, size, type, and grade.

C. Concrete testing shall be performed prior to and during placement.

PART 2 PRODUCTS

2.01. FORMWORK

A. Form materials shall be new wood, new plywood, or steel. Worn, used forms will not be allowed on exposed work.

B. Chamfer forming strips for exposed edges of concrete.

1. Exposed edges and outside corners of concrete shall be formed with 3/4-inch by 3/4-inch chamfer forming strips.

2. Provide chamfer to other areas as indicated on the Drawings.

C. Forms shall be coated with a release agent which will not stain concrete or absorb moisture.

D. Form Ties

1. Form ties shall leave no metal closer than 1-inch to the surface of the finished concrete. The ends of the form ties shall create cone-shaped tie holes for sealing with plug mortar.

2. Snap ties without cone-shaped ends that leave metal exposed at surface can only be used at unexposed areas of frost walls and retaining walls.

3. Ties used for watertight and below-grade structures shall contain an integral waterstop.

2.02. REINFORCING STEEL

A. Deformed Reinforcing Bars - ASTM A615, Grade 60.

B. Bar Supports and Bolsters

1. Bar supports and bolsters shall be a non-bleeding and non-staining material where concrete surfaces remain exposed. Plastic, plastic tipped, or stainless steel bar supports shall be used for this purpose.

2. Bar supports bearing on grade, insulation, or fill material shall be continuous runner type supplied with continuous welded-on plates, or minimum 4000 psi precast concrete blocks specifically cast for this intended use to assure proper support of reinforcement. Individual high chair supports will not be considered adequate.

The use of pavers, brick, or concrete masonry units (CMU) to support reinforcement shall not be permitted.

2.03. CONCRETE

A. Concrete Classes and Their Use

Mix A - All cast-in-place concrete on this project.
Mix C-F – Concrete topping with fibers.

Mix	28-Day Compressive Strength (psi)	Coarse Aggregate Size per ASTM C33	Minimum Total Cementitious Content (lbs/CY)	Maximum Water/ Cement Ratio (w/c)(1)	Air Content %(2)	Maximum Water-Soluble Chloride Ion (CL^-)
A	4,000	#57	550	0.44	6.0	0.30
C-F	4,000	#7	550	0.44	6.0	0.30

(1) The maximum water/cement ratio shall be considered for selection of supplier's mix design. The water/cement ratio specified in the approved mix design shall be the maximum used in production.
2) Tolerance for air content is ±1-1/2 percent.

B. All concrete shall be air-entrained as specified in the above chart.

C. Without plasticizers, concrete slump for flatwork shall not exceed 3 inches. Wall concrete shall be placed with a maximum slump of 4 inches. If necessary, superplasticizers may be added to wall placement, and corresponding maximum slump shall be 6 inches.

D. Mix C-F shall contain short fiber reinforcement at a rate of 2 lbs/CY. Polypropylene Micro-fibers – Synthetic fibers for use in fiber-reinforced concrete topping shall be 100 percent virgin polypropylene self-fibrillating micro-fibers conforming to Type III per ASTM C1116 Section 4.1.3; use Euclid "Fiberstrand F" fibers or Propex Concrete Systems "Fibermesh 300" fibers.

2.04. MATERIALS

A. Cement shall be Portland cement Type I or Type II and shall conform to ASTM C150.

B. Pozzolans

1. Fly ash shall meet the requirements of ASTM C618 Class F, except as modified below:

a. Loss of Ignition, Maximum - 5.0 percent.

b. Maximum Retained on #325 Sieve - 30 percent.

A blend of Portland cement and fly ash shall be between 15 to 25 percent of total cementitious content.

2. Blastfurnace slag shall meet the requirements of ASTM C989 and be specifically manufactured to produce higher concrete strengths and provide greater resistance to chloride penetration and sulfate attack.

A blend of Portland cement and ground iron blastfurnace slag shall contain no more than 50 percent slag. The resulting blend of cementitious material shall meet the requirements of ASTM C595.

C. Aggregates

1. Fine Aggregate (Sand)

a. Natural or manufactured siliceous sand.

b. Quantity of deleterious substances as approved by State DOT or as limited by Table 1 of ASTM C33.

c. Graded within the limits of ASTM C33.

2. Coarse Aggregate

a. Crushed stone or crushed gravel.

b. Quantity of deleterious substances as approved by State DOT or as limited by Table 3 of ASTM C33 for Class [3S] [4S] aggregates.

c. Graded within the limits of ASTM C33.

3. Five cycle soundness tests for fine and coarse aggregates shall meet the requirements of ASTM C33.

PERCENT LOSS

	MAGNESIUM SULFATE	SODIUM SULFATE
Fine aggregate(1)	15	10
Coarse aggregate(2)	18	12

(1) If provided results of soundness tests exceed these limits, it would be acceptable to provide a certified letter attesting to the favorable performance of the fine aggregates as outlined in ASTM C33, Article 8.
(2) Soundness tests for coarse aggregates do not need to be provided if they are approved by State DOT for use with concrete. Submit verification of such.

4. Source of fine and coarse aggregates shall not have a history pertaining to alkali-aggregate reactivity. In the event that aggregate source with potential alkali-aggregate reactivity is unavoidable, at least two of the following measures shall be taken to minimize this reaction:

a. Provide low alkali cement (<0.60 percent alkalies).

b. Use lithium-based additives.

c. Test aggregates to show non-reactive.

d. Use fly ash (minimum 20 percent content) or slag.

D. Mixing Water - Clear and potable.

2.05. ADMIXTURES

A. General - Admixtures other than those specified may only be used after written approval by the ENGINEER.

B. Admixtures shall be as manufactured by BASF Chemical Company; Sika Corporation; The Euclid Chemical Company; W.R. Grace, Inc.; or equal.

C. Air Entrainment Admixture - All concrete [requiring air entrainment] shall contain an air entrainment admixture meeting the requirements of ASTM C260.

D. Water Reducing Admixture - All concrete shall contain a water reducing admixture that meets the requirements of ASTM C494 Type A (water reducing) or Type F (superplasticizer). This admixture shall not contain chlorides.

E. Retarding Admixture - If air temperatures are expected to exceed 85 degrees F during the placement and/or finishing of any flatwork, a retarding admixture shall be used that meets the requirements of ASTM C494 Type D.

F. Evaporation Reducer - For all concrete flatwork during hot and/or windy weather conditions, apply to freshly placed concrete prior to finishing. Use BASF Chemical Company “Confilm,” L&M Construction Chemicals “E-Con,” Conspec (by Dayton Superior) “Aquafilm,” or equal.

2.06. OTHER PRODUCTS

A. Bonding Agent – When placing freshly-mixed concrete against existing hardened concrete, use a corrosion inhibiting, non-vapor barrier, extended open time bonding compound.

Use Sika Corporation “Armatec 110 EpoCem,” The Euclid Chemical Company “Duralprep A.C.,” Larsen Products Corporation “Weld-Crete,” or equal.

B. Liquid curing compound shall only be used during cold weather conditions and curing of foundation wall strip footings. When allowed, use a dissipating, VOC-compliant, water-based membrane forming with fugitive dye, conforming to ASTM C309, Type 1-D. Curing compound shall be applied at twice the manufacturer’s recommended application rate.

Use Euclid Chemical Company “Tammscure WB 30D,” SYMONS Corporation “Resi-Chem Clear Cure 1D,” W.R. Meadows, Inc. “1100-Clear” (with optional fugitive dye), or equal.

C. Waterstop material shall be PVC 6-inch x 3/8-inch ribbed center bulb waterstop No. CR-6380 by Wirestop of Paul Murphy Plastics Company; No. RB6-38 by Vinylex; No. 705 by Greenstreak; or equal.

D. Where shown on the Drawings and where new concrete is cast against hardened concrete:

1. Provide a premolded 1-inch by 3/4-inch bentonite self-adhering waterstop strip which expands on contact with water, applied with primer adhesive. The bentonite waterstop material shall meet the requirements of ASTM D217. Waterstop and adhesive shall be “Waterstop-RX” and “CetSeal” by CETCO Building Materials Group; “Swellstop” and “Swellstop Primer” by Greenstreak; or equal.

E. Isolation joint filler shall be preformed, closed cell, high grade polyethylene or non-extruding PVC, such as “Expansion Joint Filler” by BASF Chemical Company; “Plastic Expansion Board” by Westec Barrier Technologies; “Deck-O-Foam” by W.R. Meadows, Inc.; or equal.

1. Joint fillers shall be held back for sealants.

2. The joint filler shall be compatible as a back-up material, with regard to the sealant not bonding to or being stained by the backup.

F. Sealant for joints in concrete structures shall be a two-component polyurethane material. Use Sika Corporation “Sikaflex-2c,” The Euclid Chemical Company “Eucolastic II,” or equal.

G. Chemical adhesive anchor system to install threaded anchor bolts and dowels into concrete or masonry shall be a high-strength, premeasured, two-part, self-mixing, cartridge-type epoxy adhesive, such as “HIT RE 500” by Hilti; “Epcon G5” by ITW Red Head; “ET Epoxy-Tie” by Simpson Strong-Tie Company, Inc.; or equal.

1. All framing connections for steel or aluminum members into concrete shall be a minimum of two bolts. Bolts into concrete and masonry shall not be closer than 6 inches on center, unless indicated otherwise.

H. After material sources have been established and approved, these sources shall not be changed for the duration of the project.

PART 3 EXECUTION

3.01. FORMS

A. Earth cut forms shall not be used; all footings, base slabs, etc., shall be formed.

B. CONTRACTOR is responsible for design and bracing of all forms for strength, integrity, and to produce the desired tolerances and finishes.

3.02. TOLERANCES FOR FORMED SURFACES

A. Tolerances apply to concrete dimensions only, not to positioning of reinforcing steel or cast-in/embedded items.

1.	**Variation from plumb:**	
	a. In the lines and surfaces of columns, piers, walls, and other vertical members:	1/4 inch
	b. For exposed corners of walls and columns, construction/ control joint grooves, and other conspicuous vertical lines:	1/4 inch
2.	**Variation from level or from grades specified:**	
	a. In slab soffits, ceilings and beam soffits, measured before removal of supporting shores:	1/4 inch
	b. In exposed lintels, sills, parapets, grooves, tops of walls, slab edges, and other conspicuous horizontal lines:	1/4 inch
3.	Variation of the linear [building lines] [lines of structures] from position in plan and related position of columns, walls, and partitions:	1/2 inch
4.	Variation in the sizes and location of sleeves, floor openings, and wall openings:	±1/4 inch
5.	Variation in [cross-sectional dimensions of columns and beams and in the] thickness of slabs and walls:	-1/4 inch +1/2 inch
6.	Footings and thickened edges of slabs:	
	a. Variations in dimensions in plan:	-1/2 inch +2 inches
	b. Misplacement or eccentricity:	
	• 2 percent of the footing width in the direction of misplacement but not more than 2 inches	
	c. Thickness:	
	• Decrease in specified thickness	5 percent
	• Increase in specified thickness. No limit but increased thickness must be maintained for minimum 5 feet 0 inch length	

3.03. CONCRETE COVER

A. Clear concrete cover not indicated on Drawings shall conform to ACI 318 and ACI 350, as applicable. However, in no case shall the clear cover be less than 1-1/2 inches.

B. Contrary to the practice permitted by CRSI, the use of brick or CMU block supports for reinforcement shall not be permitted. Only special made wire bar supports or special cast, precast concrete blocks shall be allowed.

C. All metal and plastic bar supports bearing on grade shall have continuous runners to prevent settlement during construction activities.

D. Metal ties used for tying rebar shall be bent parallel to the rebar mat after tying. Do not allow tie ends to extend into the concrete cover zone.

3.04. CLEANING

A. Prior to concrete deposition, reinforcing steel shall be free from mortar, mud, loose mill and rust scale, grease, oil or any other coatings, including ice, that would destroy or reduce bond with the concrete.

3.05. PREPARATION, MIXING, AND HANDLING OF CONCRETE

A. Batch Plant Requirements - Measurement of materials at the batch plant shall be in accordance with ASTM C94.

B. Mixing Methods - All concrete shall be ready mixed to meet the requirements of ASTM C94.

A written delivery slip or ticket, prepared and signed by the plant operator shall be made out at the proportioning plant for each truck load batch. Each slip shall show the following information:

- Truck number
- Date and time truck is batched
- Ticket number
- Mix designation of concrete (per paragraph 2.03.A)
- Cubic yards of concrete
- Cement brand, type and weight in pounds
- Weight in pounds of each size and type of aggregate
- Admixtures, brand and weight in pounds and ounces
- Moisture content of fine and coarse aggregates
- Water added to the batch at the plant
- Water added to the batch during transport
- Water added to the batch at the job site

The driver shall record the number of gallons of water added during transport and at the job site. In no case shall the w/c ratio be exceeded.

Any truck delivering concrete to the job site without a delivery slip will be rejected and shall immediately depart from the job site.

C. Heating and Cooling of Materials - The batch plant shall be equipped to heat aggregates and water, or cool water with ice, and cool aggregates by shading and/or spraying with cool water to obtain acceptable concrete delivery temperatures in the range of 55 to 85 degrees F. Aggregates shall not contain ice or have frozen lumps nor shall they be heated to a temperature over 120 degrees F.

D. Surface Preparation for Concrete Topping in Sulfuric Acid containment areas -SSPC-SP13 / NACE No.6 Surface Preparation of Concrete: The CONTRACTOR shall remove loose and deteriorated concrete and all existing coatings and contaminants by Abrasive Blast Cleaning, Ultra High Pressure Jetting, and/or Mechanical Cleaning in accordance with SSPC-SP13 / NACE No.6 the Surface Preparation of Concrete.

3.06. CONCRETE PLACEMENT

A. The CONTRACTOR shall notify the ENGINEER (and Special Inspector when required) a minimum of 48 hours in advance of placement to allow sufficient time for inspection and for any corrective measures which are subsequently required.

B. Concrete shall be placed in accordance with ACI 304 and ACI 318.

C. Concrete shall be placed and vibrated in lifts not exceeding 30 inches.

D. Curing and protection of the concrete shall begin immediately after completion of the finishing operation.

E. Adjacent concrete placements (sections) shall not be placed any sooner than three days following placement of newly cast sections.

3.07. FORM REMOVAL

A. The CONTRACTOR shall assume full responsibility for the strength of all components from which forms are removed.

B. Forms and supports shall remain undisturbed until the concrete has attained sufficient strength to support its own weight in addition to any anticipated loads (temporary or permanent) that may be placed upon it during subsequent work. In no event shall forms be loosened or removed prior to 24 hours' wet cure time. Re-shore at midspan where necessary.

C. Vertical forms such as beam side forms, column forms, and wall forms may be removed at any time after 24 hours, provided that stripping does not damage surfaces and such action does not endanger any part of the structure. Coordinate timing of form removal with rub finish requirements.

D. No structural forms supporting suspended slabs or beams shall be removed prior to concrete attaining at least 80 percent of the required design strength and less than 14 days.

E. Residue of the form release agent shall be completely cleaned off the concrete surface.

3.08. FINISHING

A. The finish of all walls and slabs (vertical and horizontal surfaces, respectively) shall be as described below and in accordance with the schedules at the end of this Article.

B. As-Cast Wall Finishes

1. Type I - Rough Form Finish - Tie holes and defects shall be filled with patching mortar. Fins exceeding 1/4-inch in height shall be chipped off or rubbed off. Otherwise, surfaces shall be left with the texture imprinted by the forms.

2. Type II - Smooth Form Finish - The form facing material shall produce a smooth, hard, uniform texture on the concrete.

   Tie holes and defects (including bugholes) shall be patched with a grout rubbing mixture as defined below. All fins shall be completely removed.

C. Rubbed Wall Finishes - The following finishes shall be produced on concrete with a Type II smooth form finish. Where a rubbed finish is to be applied, the forms shall have been removed and necessary patching completed.

1. Type III - New Concrete, Smooth Rubbed Finish - New concrete is defined here as concrete less than seven days old.

   a. The finishing shall be applied no later than the day following form removal (green concrete maximum seven days old). Surfaces shall be wetted and rubbed with a carborundum brick until uniform color and texture are produced.

   b. No cement grout shall be used other than the cement paste drawn from the concrete itself by the rubbing process. Delayed application of Type III finish will not be accepted. A Type IV finish will be required.

2. Type IV - Old Concrete, Grout-Cleaned Rubbed Finish - Old concrete is defined here as concrete over seven days old that cannot be “green rubbed.”

   a. The walls shall have previously received a Type II finish. This finish will not hide projections caused by form slippage and alignment problems.

   b. Large areas more than 12 feet high or 24 feet long shall be marked off with chalk lines to produce a uniform overall pattern.

   c. A grout rubbing mixture shall be 1 part Portland cement and 1-1/2 parts fine sand mixed to a stiff masonry mortar consistency.

      The sand and the Portland cement shall be obtained from the concrete plant where the concrete was purchased and shall be the same as used in the concrete.

   d. The surface shall be soaked with water. The surface being worked on shall not be in direct sunlight while finishing. Curing in direct sunlight is acceptable.

e. Immediately after soaking, apply the grout rubbing mixture with a rubber or cork float. The material is spread to form a paste over the area being worked on.

1) The applicator shall always work to a wet edge.

2) If the area starts to visually lighten up or dry, water can be added by shaking a wetted brush onto the surface.

3) The coated area shall be permitted to set similar to waiting for a concrete floor to set.

f. The applicator shall use a carborundum brick to vigorously work the material in a circular motion to a smooth rubbed finish. It is not intended to leave a thin grout coating or a “swirl” or “fan” pattern in the surface.

g. Should the mixture start to dry out or get too stiff to work, the applicator may re-wet the wall with either a pump or brush.

h. When the area is complete, it will be smooth and dark-to-medium grey in color. The smooth surface will be equal to a medium grade of sand paper with no evidence of patterns or individual rubbing strokes. No globs of excess material shall remain.

i. Spray surface with liquid curing compound.

j. When viewed from a distance about 10 to 20 feet, the concrete will appear to be a uniform grey, creamy smooth surface.

D. Slab Finishes - The finish of all slabs and top of walls shall be described below:

1. Type A - Floated Finish - After the concrete has been placed, consolidated, struck off, and leveled, the concrete shall not be worked further until ready for floating. Preferably a magnesium float will be used.

a. Floating shall begin when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. During or after the first floating, planeness of surface shall be checked with a 10-foot straightedge.

b. If water has been brought to the surface by the rough floating operation, additional floating shall not proceed until this water has evaporated.

c. The slab is further floated, with all high spots cut down and all low spots filled during this procedure. The slab shall be finish floated to a uniform sandy texture.

2. Type B - Troweled Finish - The surface shall first receive a Type A floated finish. It shall then be power troweled and finally hand troweled for thorough consolidation. Additional trowelings shall be done by hand after the surface has hardened sufficiently. The final troweling shall produce a ringing sound as the trowel is moved over the surface.

a. The finished surface shall be essentially free of trowel marks, uniform in texture and appearance.

E. Finish Schedules

TABLE 030000-1 - WALL (VERTICAL) FINISHES

Type I	-
Type II	Smooth Form Finish – Interior wall surface of fill station.
Type III (1)	Smooth-Rubbed Finish – Exterior surface of fill station.

(1) Unacceptable Type III finish areas shall be refinished with a Type IV grout-cleaned rubbed finish.

TABLE 030000-2 – SLAB (HORIZONTAL) FINISHES

Type A	-
Type B	Troweled Finish – Ferric Sulfate containment area topping.
Type C	-

3.09. CURING AND PROTECTION

A. All freshly placed concrete shall be protected from adverse weather elements, and from defacement. As soon as the concrete has been placed and horizontal top surfaces have received their required finish, provision shall be made for providing sufficient water for hydration and preventing loss of moisture from the concrete for at least a seven-day period.

B. For the first 24 hours after concrete finishing, no work shall commence nor shall any material be placed on the newly cast concrete. The exposed concrete surfaces shall be protected from any potential damage with plywood or other means for the remaining six days of the curing period.

C. Interruptions, not to exceed a total of four hours are permitted for the purpose of layout or other required construction needs as long as the surface is not allowed to completely dry. Be prepared to spray the exposed surface every 15 to 30 minutes.

D. Walls and Columns (and Pilaster)

1. Immediately after the concrete surface has hardened enough to prevent dilution of the cement paste, provide continuous moisture for at least the first 24 hours. The forms shall be intermittently re-moistened and the concrete shall remain tightly formed and covered thereafter for a total curing period of at least seven days.

2. If forms are left in place for the entire seven-day cure, the forms can be loosened only after 24 hours to allow water to soak the sides of the concrete. If forms are loosened, continuous moisture shall be provided for the entire seven-day curing period.

3. If forms are removed in less than seven days, the walls and columns shall be sprayed with water and tightly sealed with polyethylene or burlap combined with continuous water spray for the remainder of the seven-day period.

4. If patching and finishing is done after the seven-day wall curing is completed, the walls shall be further cured by immediately spraying the entire wall surface with a heavy coating of liquid curing compound.

E. Slabs and Other Flatwork

1. After finishing and immediately after the concrete surface has hardened enough to prevent dilution of the cement paste, spray the surface with water to provide continuous moist curing for at least the first 24 hours.

2. After the initial 24-hour period, soak with water and cover for an additional six days with waterproof paper or white polyethylene blankets. Wet burlap coverings may be used if the burlap is kept wet by continuous sprinkling with water. Lap the cover material at least 12 inches, covering the top and sides of the concrete.

3. If cover material is not used, the concrete surfaces shall be kept continuously wet by spraying or other approved methods.

F. In hot weather conditions (defined in ACI 305), provide curing procedures as outlined above along with additional provisions required by ACI 305.

G. For the first 24 hours after concrete finishing, no work shall commence nor shall any material be placed on newly cast concrete. The exposed concrete surfaces shall be protected from any potential damage with plywood or other means for the remaining six days of the curing period.

3.10. TESTING FOR QUALITY ASSURANCE

A. The OWNER shall hire and pay for the services of an independent testing laboratory to perform the testing for quality assurance. Any additional testing required due to deficient construction shall be paid for by the CONTRACTOR.

B. This testing shall consist of calculation of w/c ratio; measuring slump; air content; and tests for the compressive strength. Four 6-inch diameter cylinders shall be made with 1 cylinder to be tested at 7 days, 2 cylinders to be tested at 28 days, and 1 cylinder to be tested at 56 days if the 28-day strengths are inadequate. These test results will be used by the CONTRACTOR to assist his control of quality.

C. The CONTRACTOR shall schedule and provide 48 hours' notice to the independent testing laboratory. The CONTRACTOR shall provide free access to work and cooperate with the testing laboratory.

D. In general, testing shall be required for each placement in excess of 5 cubic yards.

E. Copies of all test reports shall be mailed directly to the OWNER and ENGINEER by the testing laboratory as soon as they become available.

F. The CONTRACTOR shall accept all test results reported by the testing laboratory. Any disputed results shall be validated by an independent testing laboratory hired by the CONTRACTOR at their expense.

3.11. REPAIR OF NEWLY CAST CONCRETE

A. Areas of concrete in which cracking, spalling, or other signs of deterioration develop during initial curing or thereafter until the end of the guarantee period shall be removed and replaced, or repaired in accordance with this Article.

The CONTRACTOR may propose to use a specific method most suitable to the situation and have the method approved by the ENGINEER prior to repair. The CONTRACTOR shall submit manufacturer's product data sheets and recommended application procedures to the ENGINEER for approval prior to performing repairs.

B. Structural Cracks (as determined by ENGINEER) - Random shrinkage or structural cracks shall be repaired utilizing a low viscosity, 100 percent solids, two-component epoxy resin system.

Crack or void must be dry at time of application. Remove all dust, debris or disintegrated material from crack or void by use of oil-free compressed air or vacuuming or by other approved methods as may be required by manufacturer. After successful crack repair, remove temporary seal and excess adhesive. Clean surfaces adjacent to repair and blend finish.

Surface preparation, mixing, and application shall be in conformance with manufacturer's recommendations.

Prior to repair, CONTRACTOR shall submit a suitable remedial product and installation procedures to the ENGINEER for approval.

C. Leaking and/or Active Cracks (that are not structural cracks) – Leaking and active cracks shall be repaired utilizing a low viscosity, hydrophobic, closed cell polyurethane foam injection system.

Inject water into the crack to thoroughly flush out the crack and remove dirt, dust, and contaminants. Follow flush water by injecting urethane foam with accelerating catalyst as required. After successful crack repair, continue wall preparation by removing injection ports and grind to remove excess injection material and surface seal. Patch port holes and blend wall finish with surrounding area.

Surface preparation, mixing, and application shall be in conformance with manufacturer's recommendations.

Prior to repair, CONTRACTOR shall submit a suitable remedial product and installation procedures to the ENGINEER for approval.

D. Excessive surface cracking in concrete slabs as defined herein shall receive a penetrating epoxy resin sealer to seal the cracks.

Excessive cracking shall be defined as areas containing "craze cracking" or "map cracking" as defined by ACI 201.1. In the event that excessive cracking occurs in isolated areas of a given concrete slab, sealer could only be required in the area of the cracks bounded by construction or control joints pending ENGINEER approval.

Surface preparations, priming, mixing, application and finishing shall be in accordance with the manufacturer's recommendations.

Epoxy resin penetrating sealer shall be “Sikadur 55 SLV” by Sika Corporation, or equal. CONTRACTOR shall submit a suitable remedial product and installation procedures to the ENGINEER for approval.

E. All spalled, weakened, damaged or disintegrated concrete and areas of honeycombing shall be removed to sound concrete.

1. For spalled or honeycombing areas involving depths generally less than 3 inches, utilize a polymer-modified cementitious repair mortar, such as Sika Corporation “Sikatop 122 or 123,” Euclid Chemical Company “Verticoat,” BASF Construction Chemicals “HB2 Repair Mortar,” or equal.

2. Surface preparation, mixing, priming and application shall be in conformance with manufacturer’s recommendations.

END OF SECTION

SECTION 15100

WATER VALVES AND APPURTENANCES

PART 1 GENERAL

1.01. SCOPE OF WORK

A. Furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves and appurtenances as shown on the Drawings and as specified herein.

1.02. REFERENCES

A. Codes, specifications, and standards referred to by number or title form a part of this Section to the extent required by the references to codes, specifications, and standards. Latest revisions, as of the date of bid opening, apply, unless otherwise noted on the Drawings or specified in this Section.

B. Standards

ANSI/AWWA and C111/A21.11	Rubber-Gasket Joints for Ductile-Iron Gray-Iron Pressure Pipe and Fittings
ANSI/AWWA Valves C500	Gate
ANSI/AWWA C509	Resilient-Seated Gate Valves 3 through 12 NPS, for Water and Sewage Systems
ANSI/B16.1	Cast Iron Pipe Flanges and Flanged Fittings, Class 125
ANSI/B16.3	Malleable Iron Threaded Fittings, Class 150 and 300
ANSI/B16.5	Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and Other Special Alloys
ASTM A276	Specification for Stainless and Heat-Resisting Steel Bars and Shapes
ASTM A231	Specification for Steel Casting, Austenitic, for High-Temperature Service
ASTM A743	Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, and Nickel-Base Corrosion-Resistant for General Application
MSS SP-60	Connecting Flange Joint Between Tapping Sleeves and Tapping Valves

1.03. DEFINITIONS

A. References to valve sizes on the Drawings and in the Specifications are intended to be nominal size, and shall be interpreted as nominal size.

1.04. SUBMITTALS

A. Submittals shall be as specified in:

1. Section 01300 – Submittals

1.05. QUALITY ASSURANCE

A. Testing

1. Valves shall be tested as specified in this Section.

PART 2 PRODUCTS

2.01. GENERAL

A. All valves and appurtenances shall be of the size shown on the Drawings and as far as possible, all equipment of the same type shall be from one manufacturer.

B. All valves and appurtenances shall have the name of the maker and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.

2.02. MANUFACTURERS

A. U.S. Pipe Metroseal 250, MWayne, American or equal by U.S. manufacturer.

2.03. DESIGN

A. Resilient, Wedge or Gate Valves and Boxes

1. Valves for pipe less than 2" in diameter shall conform to the requirements of AWWA C509 (latest revision) and shall be cast iron, single wedge, non-rising stem, screwed bonnet, 125 pounds S.P., 200 pounds W.O.G with stuffing box repackable under pressure and all parts renewable. Ends shall be as shown or indicated on the drawings.

2. Resilient, wedge or gate valves 2" in diameter and larger shall be cast or ductile iron body, non-rising stem, bronze mounted gate valves, mechanical joint conforming to requirements of the AWWA Standard C509 and shall be provided with a 2" square operating nut. Valves shall be resilient, wedge, or gate type and shall turn to the left (counter clockwise) to open. The wedge or gate shall be cast iron or ductile iron per ASTM A536, minimum 65,000 psi strength and, completely encapsulated with urethane rubber, permanently bonded to the wedge or gate to meet ASTM test for rubber metal bond, ASTM D429. The valve stems for non-rising stem assemblies shall be cast bronze with integral collars in full compliance with AWWA. The NRS stem stuffing box shall be the O-ring seal type with two rings located above thrust collar; the two rings shall be replaceable with valve fully open and subjected to full rated working pressure.

3. There shall be two low torque thrust bearings located above and below the stem collar. The stem nut shall be independent of wedge and shall be made of solid bronze. There shall be a smooth unobstructed waterway free of all pockets, cavities and depressions in the seat area. The body and bonnet shall be coated with fusion bonded epoxy both interior and exterior. The valve shall be designed and tested to be opened and closed under a differential pressure of 150 psi or greater.

B. Valves for Buried Service

1. Valves for buried service shall meet all the requirements as specified herein for interior except that buried valves shall have mechanical joint ends.

2. All buried valves shall have cast-iron three-piece valve boxes, valve boxes shall be provided with suitable heavy bonnets to extend to such elevation at the finished grade surface as directed by the ENGINEER. The barrel shall be two-piece, screw type, having 53" shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling, shall be designed so as to prevent the transmission of surface loads directly to the valve or piping, and shall be complete with cast iron covers. Covers shall have "WATER" cast into the top. The covers shall be so constructed as to prevent tipping or rattling. Valve boxes shall be manufactured by OPELIKA FOUNDRY COMPANY, Opelika, Alabama or TYLER PIPE DIVISION, Tyler, Texas or approved equal.

3. One tee-handled wrench of suitable length shall be furnished to operate each valve with a valve box.

4. Where valves are located out of pavement, the boxes shall be adjusted to finished grade and a concrete slab two feet square and six inches thick shall be poured around the box.

5. Valve boxes shall be of the heavy duty, traffic bearing cast iron, adjustable screw type with a drop cover. The valve box assembly shall consist of a bottom section, top section and cover, which is cast from gray iron, formulated to ASTM specification A-48 latest revision, class 30 minimum and shall be free from blowholes, shrinkage or other imperfections not true to pattern. The shaft size shall be 5 1/4" and the adjustable length shall be from 18" to 24". The wall thickness shall be 3/16" + 1/16". The weight of the assembly shall be 61 pounds + 2 pounds, with the cover weight being a minimum of 12 pounds.

6. The name of the manufacturer and foundry of origin shall be cast into each of the components of the assembly in legible form. The assembly shall be suitable for highway traffic wheel loads of 16,000 pounds and shall withstand a proof load test of 25,000 pounds without failure or permanent deflection, as per Federal Specification RR-F-621-C, latest revision. The valve box shall be cast, machined, assembled, and packaged within the United States and shall fully comply with the Buy American provisions of Public Law 102-240, enacted 12/18/9.

C. Gate Valves Greater than 20 Inches

1. Valves larger than 20" in diameter and larger shall be approved by the County and shall be epoxy-coated, cast or ductile iron body mechanical joint type conforming to requirements of the AWWA Standards and shall be provided with a 2" square operating nut.

2. Valves 20” or larger must have a 4" bypass line and 4" gate valve. If a Metroseal 250 or approved equal resilient gate valve is used, the 4" bypass line and 4" gate valve is not required. Butterfly valves may be used for valves greater than 24" without the 4" bypass line and 4" gate valve.

D. Insertion Valves

1. Insertion valves shall be Team model InsertValve.

2. Insertion valves shall only be used as permitted by the OWNER and ENGINEER. Insertion valves shall meet the requirements of AWWA C515, seat on the valve body and be rated for a working pressure of 250-psi or greater. All insertion valves shall be made of ductile iron in conformance with ASTM A-536 Grade 65-45-12 and epoxy

coated at a minimum of 10-mils. Insertion valves are available for pipe sizes through 12-inches in diameter. In cases where insertion valves are being installed to shut down water to a work zone area, the insertion valves shall be located a minimum of 100-ft from the Work zone or greater as determined by the ENGINEER. The insertion valve shall safely operate as a dead end without dislodging from the pipeline or otherwise causing the pipeline to shift.

3. CONTRACTOR shall field verify outer diameter of pipeline prior to ordering the insertion valves.

PART 3 EXECUTION

3.01. INSTALLATION

A. All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the ENGINEER before they are installed.

B. After installation, all valves and appurtenances shall be tested at least one hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the ENGINEER.

C. Install all floor boxes, brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the CONTRACTOR shall check all plans and figures, which have a direct bearing on their location, and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.

D. Flanged joints shall be made with Series 300, stainless steel bolts. All exposed bolts shall be made with Series 300 stainless steel bolts.

E. Prior to assembly of split couplings, the grooves as well as other parts shall be thoroughly cleaned. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap or graphite paste, and the gasket shall be slipped over one pipe end. After the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. The housing sections then shall be placed. After the bolts have been inserted, the nuts shall be tightened until the housing sections are firmly in contact, metal-to-metal, without excessive bolt tension.

F. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8". Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6" from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flaires. After the bolts have been inserted and all nuts have been made up finger-tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.

G. Valves to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8". Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6" from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly

and firmly into the middle ring flaires. After the bolts have been inserted and all nuts have been made up finger-tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.

H. Valve boxes shall be carefully centered over the operating nuts of the valves so as to permit a valve wrench or key to be fitted easily to the operating nut. Valve boxes shall be set to conform to the level of the finished surface and held in position by a ring of concrete placed under the support flange as shown on the details in Section 9 of the Lee County Utilities Operations Manual. The valve box shall not transmit surface loads to the pipe or valve. Care shall be taken to prevent earth and other material from entering the valve box.

I. Any valve box which is out of alignment or whose top does not conform to the finished ground surface shall be dug and reset. Before final acceptance of the work, all valve boxes shall be adjusted to finish grade. Valve operating risers shall be installed with any valves required to ensure that the operating nut is 30 inches or less from the ground surface.

3.02. SHOP PAINTING

A. Ferrous surfaces of valves and appurtenances shall receive a coating of epoxy in accordance with AWWA Standard C550 and meets or exceeds all test requirements including the Food and Drug Administration Document Title 21 of the Federal Regulations on Food Additives, Section 175.000 entitled "Resinous and Polymeric Coating"; Impact Test Requirement in accordance with the ASTM D2794

END OF SECTION

SECTION 15110

WASTEWATER VALVES AND APPURTENANCES

PART 1 GENERAL

1.01. SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install complete and ready for operation all valves and appurtenances as shown on the Drawings and as specified herein.

B. The equipment shall include, but not be limited to, the following:

1. Eccentric Plug Valves
2. Flange Adapter Couplings
3. Flexible Couplings
4. Diaphragm Seals
5. Unions
6. Mechanical Type Seals

1.02. DESCRIPTION OF SYSTEMS

A. All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of wastewater and reclaimed water.

1.03. QUALIFICATIONS

A. All of the types of valves and appurtenances shall be products of well established reputable firms who are fully experienced, reputable and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications as applicable.

1.04. SUBMITTALS

A. Submit within 30 days after execution of the contract a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.

B. Complete shop drawings of all valves and appurtenances shall be submitted to the ENGINEER for approval in accordance with the requirements of the General Conditions.

1.05. TOOLS

A. Special tools, if required for normal operation and maintenance shall be supplied with the equipment.

PART 2 PRODUCTS

2.01. GENERAL

A. All valves and appurtenances shall be of the size shown on the Drawings and as far as possible, all equipment of the same type shall be from one manufacturer.

B. All valves and appurtenances shall have the name of the maker and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.

2.02. ECCENTRIC PLUG VALVES

A. All valves shall be eccentric plug valves unless otherwise specified. Valves shall be as manufactured by DeZurik, Kennedy, or approved equal.

B. Plug valves shall be tested in accordance with AWWA C504 Section 5. Each valve shall be performance tested in accordance with AWWA C504 Section 5.2 and shall be given a leakage test and hydrostatic test as described in AWWA C504 Paragraphs 5.3 and 5.4. The leakage test shall be applied to the face of the plug tending to unseat the valve. The Manufacturer shall furnish certified copies of reports covering proof of design testing as described in AWWA C504 Section 5.5.

C. Plug valves shall be of the tight closing, resilient faced, non-lubricating variety and shall be of eccentric design such that the valve's pressure member (plug) rises off the body seat contact area immediately upon shaft rotation during the opening movement. Valve pressure ratings shall be as follows and shall be established by hydrostatic tests as specified by ANSI B16.1-1967. Valves shall be drip-tight in both directions (bi-directional) at rated pressure, 175 psi through 12-inch diameter, 150 psi for 14-inch diameter and above. The valve shall be provided with a 2-inch square operating nut.

D. The valve body shall be constructed of cast iron ASTM A126, Class B. Body ends shall be mechanical joint to meet the requirements of AWWA C111/ANSI A21.11 or single gasket push-on type.

E. The valve plug shall be constructed of cast iron or ductile iron and shall have a conical seating surface which is eccentrically offset from the center of the plug shafts. The plug and shafts shall be integral. The entire plug face shall be totally encapsulated with Buna N (Nitrile) rubber in all valve sizes. The rubber to metal bond must withstand 75 lbs. pull under test procedure ASTM D-429-73, Method B. When the plug is in full open position, plug geometry and body waterway contours must provide a passageway that allows flow capacity equal to 100% of the adjacent pipe area.

F. Valve seat mating surface shall be constructed of a welded-in overlay of not less than 90% nickel or be a one-piece 304 stainless steel ring. Seat ring contour must be precision machined

G. A mechanical "brake" shall be supplied on all valves and shall be capable of "locking" the valve in any intermediate position between full-open and full-closed.

H. Valves shall have multiple V-type packing and packing glands and shall be capable of being field adjusted or repacked without the bonnet or plug being removed from the valve with the valve under the full rated pressure. Valves shall have a port position indicate.

I. For corrosion protection, the interior ferrous surfaces of all plug valves shall have a 2-part epoxy internal coating to a minimum of 20 mils thickness.

J. Valve shaft seals shall be adjustable and comply with AWWA C507 Section 10 and with AWWA C507 Section 11.

K. Manual valves shall have lever or gear actuators and tee wrenches, extension stems, floorstands, etc. as indicated on the plans. All valves 6" and larger shall be equipped with gear actuators. All gearing shall be enclosed in a semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator. All actuator shafts shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. All adjustable stop shall be provided to set closing torque. All exposed nuts, bolts, and washers shall be zinc or cadmium plated. Valve packing adjustment shall be accessible without disassembly of the actuator.

L. Valves and gear actuators for submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs and washers shall be stainless steel.

M. Three-way plug valves shall be non-lubricated gear oriented. Valve bodies shall be ASTM A-126 Class, and be semi-steel with 125 lb. ANSI standard flanges. Plugs shall be resilient faced. Three-way valves shall be 3-way, 3 port 270 degree turn.

N. Plug valves installed such that actuators are 6 feet or more above the floor shall have chain wheels.

O. Where shown on the Drawings, plug valves shall be installed with extended shafts and actuators. Actuators for extended shafts shall be mounted on floor stands where indicated on the drawings or shall be removable handwheels where floor stands are not called for. Six-inch sleeves shall be provided for extended shafts in all floors; where necessary covers shall be provided. Shafts shall be of adequate strength to operate the valve and shall be 304 stainless steel where submerged and carbon steel elsewhere. Floor stands and covers, where called for shall be cast iron. Floor stands shall be equipped with valve position indicators. Where shown on the drawings, plug valves shall be furnished with extended bonnets, equal to DeZurik Figure 640.

P. All buried plug valves shall have a remote position indicator in the valve box showing position of the valve. A stainless steel centering and I.D. plate shall be provided showing direction of opening and number of turns to open for each valve.

2.03. VALVES FOR BURIED SERVICE

A. Valves for buried service shall meet all the requirements as specified herein for interior except that buried valves shall have mechanical joint ends.

B. All buried valves shall have cast-iron three piece valve boxes, valve boxes shall be provided with suitable heavy bonnets to extend to such elevation at the finished grade surface as directed by the ENGINEER. The barrel shall be two-piece, screw type, having 5□" shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling, shall be designed so as to prevent the transmission of surface loads directly to the valve or piping, and shall be complete with cast iron covers. Covers shall have "SEWER" cast into the top. The covers shall be so constructed as to prevent tipping or rattling. Valve boxes shall be manufactured by OPELIKA FOUNDRY COMPANY, Opelika, Alabama or TYLER PIPE DIVISION, Tyler, Texas or approved equal.

C. One tee-handled gatewrench of suitable length shall be furnished to operate each valve with a valve box.

D. Where valves are located out of pavement, the boxes shall be adjusted to finished grade and a concrete slab two feet square and six inches thick shall be poured around the box.

E. Valve boxes shall be of the heavy duty, traffic bearing cast iron, adjustable screw type with a drop cover. The valve box assembly shall consist of a bottom section, top section and cover which is cast from gray iron, formulated to ASTM specification A-48 latest revision, class 30 minimum and shall be free from blowholes, shrinkage or other imperfections not true to pattern. The shaft size shall be 5 1/4" and the adjustable length shall be from 18" to 24". The wall thickness shall be 3/16" + 1/16". The weight of the assembly shall be 61 pounds + 2 pounds, with the cover weight being a minimum of 12 pounds.

F. The name of the manufacturer and foundry of origin shall be cast into each of the components of the assembly in legible form. The assembly shall be suitable for highway traffic wheel loads of 16,000 pounds and shall withstand a proof load test of 25,000 pounds without failure or permanent deflection, as per Federal Specification RR-F-621-C, latest revision. The valve box shall be cast, machined, assembled, and packaged within the United States and shall fully comply with the Buy American provisions of Public Law 102-240, enacted 12/18/91.

2.04. FLANGE ADAPTER COUPLINGS

A. Flange adapter couplings shall be of the size and pressure rating required for each installation and shall be suitable for use on either cast iron or ductile iron pipe. They shall be similar or equal to Dresser Company, Style 128. All couplings shall have a sufficient number of factory installed anchor studs to meet or exceed the test pressure rating for this project, 100 psi minimum.

2.05. FLEXIBLE COUPLINGS

A. Flexible

1. Split type coupling shall be either the split type or the sleeve type as shown on the Drawings. The couplings shall be mechanical type for radius groove piping. The couplings shall mechanically engage and lock grooved pipe ends in a positive coupling and allow for angular deflection and contraction and expansion.

2. Couplings shall consist of malleable iron, ASTM Specification A47, Grade 32510 housing clamps in two or more parts, a single chlorinated butyl composition sealing gasket with a "C" shaped cross-section and internal sealing lips projecting diagonally inward, and two or more oval track head type bolts with hexagonal heavy nuts conforming to ASTM Specification A183 and A194 to assemble the housing clamps. Bolts and nuts shall be Series 300 stainless steel.

3. Victaulic type couplings and fittings may be used in lieu of flanged joints. Pipes shall be radius grooved as specified for use with the Victaulic couplings. Flanged adapter connections at fittings, valves, and equipment shall be Victaulic Vic Flange Style 741, equal by Gustin-Bacon Group, Division of Certain-Teed Products, Kansas City, Kansas, or equal.

4. Sleeve type couplings shall be used with all buried piping. The couplings shall be of steel and shall be Dresser Style 38, Smith Blair Style 413, Baker Allsteel, or equal. The coupling shall be provided with stainless steel bolts and nuts unless indicated otherwise.

5. All couplings shall be furnished with the pipe stop removed.

6. Couplings shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.

7. If the Contractor decides to use victaulic couplings in lieu of flanged joints, he shall be responsible for supplying supports for the joints.

2.06. DIAPHRAGM SEALS

A. Diaphragm seals shall be installed on pressure gauge connection to all lines where shown on the Drawings, to protect pressure switches used to monitor excessive pressures on pipe lines. The diaphragm shall be "thread attached" to both piping and pressure switches. Diaphragm seals shall be constructed of cadmium plated carbon steel, except for the lower housing which shall be specifically chosen according to the fluid pressure being monitored.

B. Diaphragm seals shall have a flushing connection and be Type SB Mansfield and Green; No. 877 Trerice; Ashcroft; or equal.

2.07. UNIONS

A. Unions on ferrous pipe 2" in diameter and smaller shall be 150 pounds malleable iron, zinc-coated. Unions on water piping 2□" in diameter and larger shall be flange pattern, 125 pound class, zinc-coated. Gaskets for flanged unions shall be of the best quality fiber, plastic, or leather. Unions shall not be concealed in walls, ceilings, or partitions.

2.08. MECHANICAL TYPE SEALS

A. Mechanical type seals shall consist of an adjustable modular bolted, synthetic rubber and plastic sealing element. The sealing element shall e Link-Seal LS-300-C as manufactured by Thunderline Corp., Inkster, Michigan or approved equal.

2.09. INSERTION VALVES

A. Insertion valves shall be in accordance with Section 15100 – Water Valves and Appurtenances.

PART 3 EXECUTION

3.01. INSTALLATION

A. All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the ENGINEER before they are installed.

B. Valves shall be carefully inspected, opened wide and then tightly closed and the various nuts and bolts shall be tested for tightness. Special care shall be taken to prevent any foreign matter from becoming lodged in the valve seat. Valves, unless shown otherwise shall be set with their operator shaft vertically. Any valve that does not operate correctly shall be removed and replaced.

C. Valve boxes shall be carefully centered over the operating nuts of the valves so as to permit a valve wrench or key to be fitted easily to the operating nut. Valve boxes shall be set to conform to the level of the finished surface and held in position by a ring of concrete placed under the support flange as shown on the details in Section 9 of the Lee County Utilities Operations Manual. The valve box shall not transmit surface loads to the pipe or valve. Care shall be taken to prevent earth and other material from entering the valve box. Any valve box which is out of alignment or whose top does not conform to the finished ground surface shall be dug out and reset. Before final acceptance of the work, all valve boxes shall be adjusted to finish grade. Valve operating risers shall be installed with any valves required to ensure that the operating nut is 30-inches or less from the ground surface.

D. After installation, all valves and appurtenances shall be tested at least 1 hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint proves to be defective, it shall be repaired to the satisfaction of the ENGINEER.

E. Install all floor boxes, brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, check all plans and figures, which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.

F. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections in Division 15.

G. Buried flanged or mechanical joints shall be made with Series 300, stainless steel bolts. All exposed bolts shall be made with Series 300 stainless steel bolts.

H. Prior to assembly of split couplings, the grooves as well as other parts shall be thoroughly cleaned. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap or graphite paste, and the gasket shall be slipped over one pipe end. After the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. The housing sections then shall be placed. After the bolts have been inserted, the nuts shall be tightened until the housing sections are firmly in contact, metal-to-metal, without excessive bolt tension.

I. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8". Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6" from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flaires. After the bolts have been inserted and all nuts have been made up finger-tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.

3.02. SHOP PAINTING

A. Ferrous surfaces of valves and appurtenances shall receive a coating of rust-inhibitive primer. All pipe connection openings shall be capped to prevent the entry of foreign matter prior to installation.

3.03. INSPECTION AND TESTING

A. Completed pipe shall be subjected to hydrostatic pressure test for hours at full working pressure. All leaks shall be repaired and line retested as approved by the ENGINEER. Prior to testing, the gravity pipelines shall be supported in an approved manner to prevent movement during tests.

END OF SECTION

SECTION 16056

ELECTRICAL DEMOLITION, REMOVALS, AND RELOCATIONS

PART 1 GENERAL

1.01. SECTION INCLUDES

A. Demolition and removal of existing electrical equipment and components.

B. Disconnection and removal of existing power distribution and control circuit raceways and conductors.

C. Removal of exterior concrete equipment pads.

D. Site lighting removals.

1.02. ELECTRICAL DEMOLITION AND REMOVALS

A. General

1. Ensure that all applicable hardware items and equipment are on hand prior to attempting any demolition work.

2. Equipment, conduits, cables and materials that are abandoned in place shall be provided with tags, labels and nameplates indicating “Spare Equipment” or similar text. Labels shall be provided as specified herein.

3. The OWNER reserves the right to remove any equipment or materials scheduled for demolition or removal up to the date of demolition, or removals actually begin. The removal, or failure to remove, by the OWNER, any equipment or material scheduled for demolition or removal shall not be cause for any additional charges by the CONTRACTOR. The CONTRACTOR shall notify the OWNER in writing at least 14 calendar days prior to beginning any demolition.

4. CONTRACTOR shall take necessary precautions to insure against damage to existing materials or equipment to remain in place, to be reused or to remain the property of the OWNER. Repair or replace damaged materials and equipment at no additional cost to the OWNER.

B. Equipment Demolition and Removals

1. Equipment and Materials

a. Refer to the Contract Drawings for details and limits of equipment and materials demolition and removals.

b. CONTRACTOR shall furnish labor to disconnect and/or remove items shown on the Contract Drawings and as specified.

2. Conduits, Conductors and Cables

a. Where electrical equipment is removed, also remove all wiring back to source panelboard, MCC, switch or to last remaining device on the same

circuit. Associated conduits, hangers, supports, etc. shall be removed unless otherwise noted or required to maintain the support and operation of remaining equipment.

b. Remove all extraneous wires and exposed conduits for all mechanical, and electrical devices to be removed or abandoned.

c. Wires to be removed which are in underground duct banks, or embedded conduit shall be removed unless otherwise noted.

d. CONTRACTOR shall disconnect and remove related equipment and conduit mounting hardware, equipment mounting racks, and equipment associated with materials to be removed unless otherwise required to maintain the support and operation of remaining equipment.

e. Any conduit abandoned in concrete slabs, walls, or other inaccessible locations shall be left empty except for a nylon pull wire. Ends shall be capped and labeled as spare for future use.

f. If cables cannot be removed due to a collapsed or deformed duct, etc. cut cable at duct entrance at each end and tag cable as “Abandoned Cable”, “collapsed duct” or similar text. Notify the OWNER of these conditions.

3. Salvage Materials

a. Equipment and materials not indicated for relocation, reuse, or salvage shall become the property of the CONTRACTOR and shall be removed by the CONTRACTOR from the premises and properly disposed of.

C. Structure Repairs and Refinishing

1. Where applicable, fill and patch penetrations, holes, damaged surfaces, etc. to restore a smooth finish to floors, ceilings, and walls.

1.03. SUBMITTALS

A. Submit detailed circuit wiring lists for motor control center, control panel, and control circuit disconnections and removals.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01. GENERAL

A. CONTRACTOR shall remove interior and exterior concrete equipment pads for equipment to be removed and/or demolished. Remove exposed conduits, rebar, and concrete.

3.02. SITE LIGHTING

A. At the WWE WTP, pole mounted site lighting fixtures powered by off-site transformers are in-service and shall remain in-service. See Drawings.

END OF SECTION

APPENDIX A
Asbestos, Lead-Based Paint, and PCB-materials Surveys

Project 11207990

February 25, 2020 Reference No. 11207990-01

Delivered via Electronic Mail

Lee County Utilities
1500 Monroe Street
Fort Myers, FL 33901

Re: **Asbestos NESHAP Demolition, Lead-Based Paint, and PCB Caulking Survey**
Fort Myers Beach WWTP
17155 Pine Ridge Road
Ft. Myers Beach, Florida 33931

1. Introduction

GHD Services Inc. (GHD) was retained by Lee County Utilities (LCU) to conduct Asbestos-Containing Materials (ACM), Lead-Based Paint (LBP), and Polychlorinated Biphenyl (PCB)-containing caulking surveys of select facilities at the Fort Myers Beach Wastewater Treatment Plant (FMB WWTP) located at 17155 Pine Ridge Road in Fort Myers Beach, Florida. The surveys were performed to provide information concerning the potential presence of ACM, LBP, and PCB-caulking that may be disturbed during the demolition of select facilities at the FMB WWTP. See Figure 1.

GHD conducted the asbestos survey in general accordance with the National Emissions Standard for Hazardous Air Pollutants (NESHAP) and the U.S. Environmental Protection Agency (EPA). The survey was conducted on January 28, 2020 by EPA certified asbestos inspector Mr. Scott Crandall, PE, FLAC of GHD (applicable EPA and State of Florida licenses/certificates can be found in the attachments to this report). The LBP survey was performed in general accordance with American Standards for Testing and Measuring (ASTM) E2119 *Practice for Quality Systems for Conducting In Situ Measurements of Lead Content in Paint or Other Coatings Using Field-Portable X-Ray Fluorescence (XRF) Devices* and E1727 *Practice for Field Collection of Soil Samples for Subsequent Lead Determination*. The PCB caulking survey was performed in accordance with generally accepted industry standards. This Asbestos, Lead-Based Paint and PCB Survey Report was produced for the exclusive use of Lee County Utilities.

The purpose of the survey was to identify, locate, and quantify suspect ACM, LBP and PCB containing materials which may be located throughout the select facilities scheduled for demolition. It is GHD's understanding that select structures and processing equipment are to be demolished or removed from the site. During the survey, suspect ACM and suspect PCB-containing materials were sampled for laboratory analysis. LBP screening was performed in the field using a hand held Niton® X-ray fluorescence (XRF) analyzer. Confirmation sampling of LBP was performed via laboratory testing.

1.1 General Buildings / Property Description

The property is an active municipal wastewater treatment plant site. Select facilities no longer used by LCU have been placed out-of-service (i.e. abandoned), including a chemicals storage pad, pressure filters and chlorine contact towers, and are scheduled for demolition. Figure 1, Site Plan, illustrates the location of the

GHD Services Inc.
Winkler Avenue Suite 180 Fort Myers Florida 33901 USA
T 239 936 4003 F 239 936 0819 www.ghd.com

various components arbitrarily identified from D-1 to D-9 for clarity in identifying the select components scheduled for demolition and included in this study.

2. Inspection, Screening, and Sample Collection

Asbestos survey and sampling procedures conducted by GHD were performed in general accordance with the NESHAP regulation and the guidelines published by the EPA in 40 CFR Part 763 Subpart E. The LBP survey was conducted in general accordance with the applicable ASTM standards. No specific standard exists for the inspection of industrial facilities for PCB-containing caulking. These inspections were performed in accordance with generally accepted industry standards.

2.1 Homogeneous Material Classifications

An initial walk-through visual inspection was conducted to determine the presence, locations and condition of suspect materials that were accessible and/or exposed in the area of facilities scheduled for demolition. Building materials that were similar in general appearance were grouped into “homogeneous” sampling areas as termed by the EPA.

Following the EPA visual inspection protocol, each identified suspect homogeneous material was placed in one of the following EPA classifications:

- **Surfacing Materials** (sprayed or trowel applied to building members)
- **Thermal System Insulation** (materials generally applied to various mechanical systems)
- **Miscellaneous Materials** (any materials which do not fit either of the above categories)

2.2 Sampling Procedures

Following the visual inspection, sampling locations were chosen and samples collected to be representative of each homogeneous material. Quantities of accessible and/or exposed building materials that were suspected of containing asbestos, LBP, or PCB-caulking were estimated by taking approximate measurements in the field. Samples of each type of suspect material identified were placed in uniquely numbered sample containers. The materials where cataloged on the appropriate field sampling form and recorded on the laboratory Chain-of-Custody (COC) form for transmission to the laboratory.

2.3 XRF Lead Screening

Field screening of suspect lead-based paint was performed on painted surfaces of select facilities scheduled for demolition using a hand-held Niton® X-ray fluorescence (XRF) analyzer. An XRF is a non-destructive instrument that emits an x-ray to excite atoms of the materials being tested. The excited atoms release electrons and energy which is measured as florescence. This florescence is unique to each element and allows the level of lead in a painted surface to be quantified. Locations and characteristics of the lead screening results were recorded. The results are provided in Appendix C. Materials with greater than 1 milligrams per centimeter squared (mg/cm^2) are defined as lead containing paints (i.e. LBP). Confirmation samples were collected from several locations that tested positive for lead (i.e. XRF reading greater than 1 mg/cm^2) and sent to the laboratory for analysis.

3. Laboratory Analyses

All samples collected during this survey for analysis of asbestos or lead, as applicable, were sent, under COC, to EMSL Analytical, Inc. (EMSL), located in Orlando, Florida. All samples collected for analysis of PCBs were sent to the EMSL laboratory in Cinnaminson, New Jersey. EMSL is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP). Their NVLAP Laboratory Number is 101151-0. EMSL is also accredited under the Environmental Lead Laboratory Accreditation Programs (ELLAP). The ELLAP approval is 163563.

3.1 Method of Analysis - Asbestos

The bulk samples collected for analysis of asbestos were analyzed by polarized light microscopy (PLM) utilizing EPA 600/R-93/116 visual estimation method. The laboratory mounts the samples on slides and then analyzes the samples for the following: asbestos (i.e., chrysotile, amosite, crocidolite, anthophyllite, and actinolite/tremolite), fibrous non-asbestos constituents (i.e., mineral wool, paper, etc.), and non-fibrous constituents. Refractive indices, morphology, color, pleochroism, birefringence, extinction characteristics, and signs of elongation are used to identify asbestos. The same characteristics are used to identify the non-asbestos constituents. The microscopist visually estimates the relative amounts of each constituent by determining the volume of each constituent in proportion to the total volume of the sample using a stereoscope. The EPA considers a homogeneous material to be asbestos containing if at least one sample of this material is greater than one percent (1%) asbestos. Conversely, EPA considers a homogeneous material to be non-asbestos containing if all the samples of that material contain 1% or less asbestos. When samples analyzed by PLM contain asbestos in amounts less than ten percent (< 10%), a more exact method of analysis called point counting may be performed at the client's request. The EPA point count method allows a sample in which asbestos was visually detected, but which is visually estimated to have 10% or less asbestos, to be quantified using a point count procedure. If not point counted, a sample in which asbestos was visually detected and estimated (including trace to ≤1%) must be assumed to be greater than 1% and treated as an ACM. The EPA point counting procedure is as follows: an ocular reticule (cross hair or point array) is used to visually superimpose a point or points on the microscope field of view. A total of 400 points superimposed on either asbestos fibers or non-asbestos matrix material must be counted over at least eight different preparations of representative sub-samples. If an asbestos fiber and matrix particle overlap so that a point is superimposed on their visual intersection, a point is scored for both categories. Point counting provides a quantification of the area percent asbestos. Per EPA's regulations, materials which have been point-counted and, therefore, quantitatively determined to have less than or equal to one percent (≤1%) asbestos, can be treated as non-ACM. No samples were point counted as part of this survey.

3.2 Method of Analysis – LBP

Based on the findings of the XRF screening, paint chip samples were collected from areas of suspected LBP and were analyzed by EPA method SW846 7000B Flame Atomic Absorption (FAA). The laboratory results are presented in percent by weight.

Three (3) paint chip samples were collected for laboratory analysis.

3.3 Method of Analysis - PCBs

The samples collected from suspected PCB-caulkings were analyzed by EPA method SW846 8082A, by Gas Chromatography. The analytical results are reported in milligrams per kilogram (mg/Kg) or ppm.

One (1) sample of suspected PCB-containing caulking material was collected for laboratory analysis.

4. Observations and Findings

4.1 Asbestos

A total of six (6) samples were collected from select facilities scheduled for demolition. No materials were assumed to contain asbestos. The following table lists each material sampled, sample locations, approximate quantity of ACMs located throughout the surveyed area (if any revealed based on laboratory analyses), percentage and type of asbestos fibers found in the material sampled (if any revealed based on laboratory analyses), and the NESHAP Category (if applicable) of the sampled material. A copy of the asbestos laboratory analytical results can be found in **Attachment A.**

Suspect Asbestos Sampling Analytical Results				
Sample No.	Material Description	Location	Asbestos / Type	NESHAP Category
1	Red Pipe Gasket Material	D-2 Pipe Assembly	None Detected	NA
2	Black Pipe Gaskets	D-2 Pipe Assembly on Brown Pipe	None Detected	NA
3	Red Pipe Gasket Material	D-3 Pipe Assembly	None Detected	NA
4	Black Pipe Gaskets	D-3 Pipe Assembly	None Detected	NA
5	Black Pipe Gaskets	D-5 Pipe Assembly	None Detected	NA
6	White Caulking Sealant	D-8 Tank	None Detected	NA

NA – Not Applicable

Based on the visual inspection and samples collected and analyzed, no ACM was identified at the select facilities scheduled for demolition at the FMB WWTP.

4.2 Lead-Based Paint

GHD conducted the LBP Screening in general accordance with ASTM Standards. The results of the XRF screening are provided in **Attachment B**. At total of fifty (50) field screening tests were performed with the XRF. Of the 50 tests locations, seven (7) of the XRF results showed the presence of lead, with three (3) locations having results over the standard of 1 mg/cm^{2}.

Based on the findings of the XRF screening, three (3) confirmation samples were collected for laboratory analysis. A copy of the LBP laboratory results can be found in **Attachment C**. A summary of the laboratory confirmation testing of LBP samples is summarized in the following table.

Suspect LBP Sampling Analytical Results				
Sample No.	**Location**	**Substrate**	**Color**	**Sample Result ppm**
LBP-1	Piping on D-2 & D-3 (composite) pressure filter tank pipe header assembly. Typical of D-2 thru D-6	Steel Pipe	Aqua Blue	<80
LBP-2	Piping on D-2 pressure filter tank pipe header assembly. Typical of D-2 thru D-6	Steel Pipe	Light Blue	19,000
LBP-3	Piping on D-4 pressure filter tank pipe header assembly. Typical of D-2 thru D-6	Steel Pipe	Brown	<80

Of note, the piping indicated as “light blue” is corrected to “light purple” and believed to be piping associated with reuse water. The “aqua blue” piping is influent/effluent piping and the “brown” piping is drain piping that drains to a sanitary sewer line.

The Federal Lead Standard/HUD (Housing and Urban Development) Standard for lead based paint is 5,000 ppm. **Based on the visual inspection, XRF field screening, and samples collected, LBPs were identified on select facilities at the FMB WWTP.**

4.3 Polychlorinated Biphenyls (PCB)-containing materials

One (1) suspect caulking material was identified at select facilities scheduled for demolition at the FMB WWTP. The material was sampled to determine the possible presence of PCBs. A copy of the PCB laboratory results can be found in **Attachment D**. The results of the PCB testing are shown below.

Suspect PCB-Containing Caulkings Analytical Results					
Sample No.	Material Description	Location	PCB Congener	Results mg/Kg (ppm)	Reporting Limit mg/Kg (ppm)
PCB-1	White Caulking Sealant	D-8-Chlorine Contact Tower.	Aroclor 1016	ND	1.0
			Aroclor 1221	ND	1.0
			Aroclor 1232	ND	1.0
			Aroclor 1242	ND	1.0
			Aroclor 1248	ND	1.0
			Aroclor 1254	ND	1.0
			Aroclor 1260	ND	1.0
			Aroclor 1262	ND	1.0
			Aroclor 1268	ND	1.0

ND – Non Detect

Waste derived from caulkings containing PCBs at greater than or equal to 50 ppm is defined as PCB bulk product waste in 40 CFR 761.3. The definition of PCB bulk product waste includes non-liquid bulk wastes or debris from the demolition of buildings and other man-made structures manufactured, coated, or serviced with PCBs.

Based on the visual inspection and sampling conducted, no PCB-containing materials were identified at select facilities scheduled for demolition at the FMB WWTP.

5. Conclusions and Recommendations

5.1 Asbestos Containing Materials

Based on visual inspection and the samples collected, no ACMs were identified at the select facilities scheduled for demolition at the FMB WWTP.

5.2 Lead-Based Paint Materials

Both the XRF field screening and the laboratory testing identified LBPs at the select facilities scheduled for demolition at the FMB WWTP. The LBPs were identified in the various paints used on the piping header assemblies of the pressure filters (i.e. D-2 thru D-6). Three colors of piping on the header assembly were identified and tested during the survey. These were the aqua blue, the light blue, and the brown piping. All three of these color paints had XRF results indicating the present of lead. The brown paint and the light blue paint had XRF readings above the LBP standard of 1 mg/cm^{2,}. The light blue paint sample sent for laboratory analysis had a lead content of 19,000 ppm, which is over the standard of 5,000 ppm. As noted above, the piping indicated as “light blue” is corrected to “light purple” and believed to be piping associated with reuse water.

An attempt was made to identify the LBPs on the header piping by the color of piping as it exists today. However, the XRF screening indicates that the lead content in the various colored paints on the header assembly is not consistent based on the current color of the piping. This is likely the result of various paints being applied to the piping over the years and/or fitting and pipe runs being replaced. It is recommend that all the paint on the piping the header assemblies (D-2 thru D-6) be assumed to be LBP.

These LBP findings should be provided to contractors working on the demolition of the header assembly so that proper worker protections can be established. OSHA established the Lead Standard for the Construction Industry, 29 CFR 1926.62, which applies to all construction work where an employee may be exposed to lead. These exposures include demolition and salvage of structures where lead or material containing lead are present. The standard defines the occupationally permissible exposure limit and specific requirements for construction work with lead-containing materials. OSHA does not have a percentage lead-in-paint action level in the current construction lead standard. OSHA regulations are driven by airborne lead exposure to workers. OSHA considers the lead regulation enforceable if the presence of *any* lead in paint at detectable concentrations is present when demolition or renovation activities are performed.

Scrap metal that is sent for recycling is not a waste and thus exempt from the hazardous waste determinations requirements. Scrap metal with LBP can be sent for recycling.

5.3 Polychlorinated Biphenyls (PCB)-Containing Materials

Based on visual inspection and sampling conducted, no caulking containing PCBs was identified at the select facilities scheduled for demolition at the FMB WWTP.

6. Closing

If, during the demolition, any additional suspect materials that have not been evaluated in this report are encountered, or if any materials are found that were not visible at the time of the survey, these materials should be not be disturbed and GHD should be contacted to further evaluated the materials.

Please contact us at (813) 971-3882 if you have any questions.

Sincerely,
GHD Services, Inc.
Asbestos Business License No. ZA338

Scott Crandall, PE,
Florida Licensed Asbestos Consultant
License No. EA000060

Attachments

Figure 1	Site Plan
Attachment A	Laboratory Analytical Results – Asbestos
Attachment B	XRF Screening Results
Attachment C	Laboratory Analytical Results – Lead-Based Paint
Attachment D	Laboratory Analytical Results – PCBs
Attachment E	Asbestos Certifications

Figure 1
Site Plan

SOURCE: LEE COUNTY PROPERTY APPRAISER WEBSITE.

FORT MYERS BEACH WASTEWATER TREATMENT PLANT
17155 PINE RIDGE ROAD
FORT MYERS, LEE COUNTY, FLORIDA 33931

11207990

13-Feb-20

SITE PLAN - FORT MYERS BEACH WWTP

FIGURE NO. 1

ATTACHMENT A
Asbestos Laboratory Analytical Results

OrderID: 342001697

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 342001697

EMSL ANALYTICAL, INC.
3303 PARKWAY CENTER COURT
ORLANDO, FLORIDA 32808

PHONE: (407) 599-5887
FAX: (407) 599-9063

Company : GHD SERVICES	**EMSL-Bill to:** ☒ Same ☐ Different If Bill to is Different note instructions in Comments**
Street: 5904 Hampton Oaks Pkwy	*Third Party Billing requires written authorization from third party*
City: Tampa / **State/Province: FL**	**Zip/Postal Code: 33610** / **Country:**
Report To (Name): Scott Crandall, PE	**Fax #:**
Telephone #: 813-335-5341	**Email Address: scott.crandall@ghd.com**
Project Name/Number: FT MYERS BEACH WWTP	**11207990**
Please Provide Results: ☐ Fax ☒ Email / **Purchase Order:**	**U.S. State Samples Taken:** FL

Turnaround Time (TAT) Options* – Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☒ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week

**For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.*

PCM - Air
- ☐ NIOSH 7400
- ☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
- ☒ PLM EPA 600/R-93/116 (<1%)
- ☐ PLM EPA NOB (<1%)

Point Count
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)

Point Count w/Gravimetric
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)
- ☐ NYS 198.1 (friable in NY)
- ☐ NYS 198.6 NOB (non-friable-NY)
- ☐ NIOSH 9002 (<1%)

TEM – Air ☐ 4-4.5hr TAT (AHERA only)
- ☐ AHERA 40 CFR, Part 763
- ☐ NIOSH 7402
- ☐ EPA Level II
- ☐ ISO 10312

TEM - Bulk
- ☐ TEM EPA NOB
- ☐ NYS NOB 198.4 (non-friable-NY)
- ☐ Chatfield SOP
- ☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
- Fibers >10µm ☐ Waste ☐ Drinking
- All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
- ☐ Microvac - ASTM D 5755
- ☐ Wipe - ASTM D6480
- ☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
- ☐ PLM CARB 435 - A (0.25% sensitivity)
- ☐ PLM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - C (0.01% sensitivity)
- ☐ EPA Protocol (Semi-Quantitative)
- ☐ EPA Protocol (Quantitative)

Other:
- ☐

☐ **Check For Positive Stop – Clearly Identify Homogenous Group**

Samplers Name: SCOTT CRANDALL | **Samplers Signature:** [signature]

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
1	RED PIPE GASKET		1/28/20
2	BLACK PIPE GASKET		
3	RED PIPE GASKET		
4	BLACK PIPE GASKET		
5	BLACK PIPE GASKET		
6	WHITE CAULK AT TANK SEAMS		

Client Sample # (s): 1-6 **Total # of Samples:** 6

Relinquished (Client): [signature] **Date:** 1/29/20 **Time:** 4pm

Received (Lab): [signature] **Date:** 1/30/2020 **Time:** 10:10

Comments/Special Instructions: LCU PLANT DEMO

EMSL Analytical, Inc.

3303 PARKWAY CENTER COURT Orlando, FL 32808

Tel/Fax: (407) 599-5887 / (407) 599-9063

http://www.EMSL.com / orlandolab@emsl.com

EMSL Order:	342001697
Customer ID:	HSES34
Customer PO:	11207990
Project ID:	LCU Plant Demolitions

Attention:	Scott Crandall	**Phone:**	(239) 936-0789
	GHD	**Fax:**	
	2675 Winkler Ave	**Received Date:**	01/30/2020 10:10 AM
	Suite 180	**Analysis Date:**	02/03/2020
	Fort Myers, FL 33901	**Collected Date:**	01/28/2020
Project:	FT Myers Beach WWTP (LCU Plant Demolitions)		

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1 *342001697-0001*	Red Pipe Gasket	Red Non-Fibrous Homogeneous		10% Ca Carbonate 90% Non-fibrous (Other)	None Detected
2 *342001697-0002*	Black Pipe Gasket	Black Non-Fibrous Homogeneous		10% Ca Carbonate 90% Non-fibrous (Other)	None Detected
3 *342001697-0003*	Red Pipe Gasket	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
4 *342001697-0004*	Black Pipe Gasket	Black Non-Fibrous Homogeneous		10% Ca Carbonate 90% Non-fibrous (Other)	None Detected
5 *342001697-0005*	Black Pipe Gasket	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
6 *342001697-0006*	White Caulk At Tank Seams	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Bryan Lopez-Duenas (2)

Laura Vera (4)

Carlos Rivadeneyra, Laboratory Director
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Orlando, FL NVLAP Lab Code 101151-0

Initial report from: 02/04/2020 08:50:49

ATTACHMENT B
XRF Lead Screening Results

XRF Lead Screening Results			
Sample No.	Paint Color Item/Substrate	Location	XRF Reading mg/cm^2
1	Calibration Check	Standard 1.04	1.01
2	Red on Concrete Containment	D-1	<0.01
3	Yellow Paint on Tank	D-1	<0.01
4	Blue Water Piping	D-1	<0.01
5	Tan on Steel Tank	D-2	<0.01
6	Red Paint on Concrete TankSaddle	D-2	<0.01
7	Aqua Blue Piping	D-2	<0.01
8	Brown Piping	D-2	**4.7**
9	Lite Blue Piping Fitting	D-2	**3.5**
10	Lite Blue Piping	D-2	<0.01
11	Tan on Steel Tank	D-3	<0.01
12	Red Paint on Concrete TankSaddle	D-3	<0.01
13	Brown Piping	D-3	**2.0**
14	Brown Piping	D-3	<0.01
15	Lite Blue Piping	D-3	**1.1**
16	Aqua Blue Piping	D-3	**0.51**
17	Brown Piping	D-3	<0.01
18	Tan on Steel Tank	D-4	<0.01
19	Red Paint on Concrete TankSaddle	D-4	<0.01
20	Brown Piping	D-4	**0.68**
21	Brown Piping	D-4	<0.01
22	Ltie Blue Piping	D-4	<0.01
23	Aqua Blue Piping	D-4	<0.01
24	Aqua Blue Piping	D-4	<0.01
25	Tan on Steel Tank	D-5	<0.01
26	Red Paint on Concrete TankSaddle	D-5	<0.02
27	Brown Piping	D-5	**0.72**
28	Brown Piping	D-3	<0.01
29	Lite Blue piping	D-5	<0.01
30	Lite Blue Piping	D-5	<0.01
31	Dark Green Pipe	D-5	<0.01
32	Aqua Blue Piping	D-5	<0.01
33	Aqua Blue Piping	D-5	<0.01
34	Tan on Steel Tank	D-6	<0.02
35	Red Paint on Concrete TankSaddle	D-6	<0.01
36	Brown Piping	D-6	<0.01
37	Aqua Blue Piping	D-6	<0.01
38	Lite Blue Piping	D-6	<0.01
39	Yellow Paint on Steel Exterior	D-8 Chlorine Contact Tower	<0.01
40	Yellow Paint on Steel Exterior	D-8 Chlorine Contact Tower	<0.02
41	Yellow Paint on Steel Exterior	D-8 Chlorine Contact Tower	<0.01
42	Yellow Paint on Steel Exterior	D-8 Chlorine Contact Tower	<0.01
43	Yellow Paint on Steel Exterior	D-9 Chlorine Contact Tower	<0.01
44	Yellow Paint on Steel Exterior	D-9 Chlorine Contact Tower	<0.01
45	Yellow Paint on Steel Exterior	D-9 Chlorine Contact Tower	<0.02
46	Yellow Paint on Steel Exterior	D-9 Chlorine Contact Tower	<0.01
47	Gray Paint on Panel	D-7-Panel Box	<0.01
48	Gray Paint on Panel	D-7-Panel Box	<0.01
49	Gray Paint on Panel	D-7-Panel Box	<0.01
50	White Powder Coat	D-7 Alumium Cover Support	<0.01

ATTACHMENT C
LEAD Analytical Laboratory Results

OrderID: 342001703

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID *(Lab Use Only)*: 342001703

EMSL ANALYTICAL, INC.
3303 PARKWAY CENTER COURT
ORLANDO FL 32808
PHONE: (407) 599-5887
FAX: (407) 599-9063

Company : GHD SErvices	**EMSL-Bill to:** ☒ Same ☐ Different If Bill to is Different note Instructions in Comments** *Third Party Billing requires written authorization from third party*
Street: 5904 Hampton Oak Parkway	
City: Tampa / **State/Province: FL**	**Zip/Postal Code: 33610** / **Country: US**
Report To (Name): scott crandall	**Telephone #: 8133355341**
Email Address: scott.crandall@ghd.com	**Fax #:** / **Purchase Order:**
Project Name/Number: Ft Myers Beach WWTP 11207990	**Please Provide Results:** ☐ Fax ☒ Email
U.S. State Samples Taken: FL 3	**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour | ☐ 6 Hour | ☐ 24 Hour | ☐ 48 Hour | ☐ 72 Hour | ☒ 96 Hour | ☐ 1 Week | ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide*

Matrix	Method	Instrument	Reporting Limit	Check
Chips ☐ % by wt. ☐ mg/cm² ☒ ppm (mg/kg)	SW846-7000B	Flame Atomic Absorption	0.01%	☒
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	☐
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	☐
	NIOSH 7300M/NIOSH 7303	ICP-OES	0.5 µg/filter	☐
Wipe* ASTM ☐ non ASTM ☐ *if no box checked, non-ASTM Wipe assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	☐
	SW846-6010B or C	ICP-OES	1.0 µg/wipe	☐
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-1311/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	☐
SPLP	SW846-1312/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-1312/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	☐
TTLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	22 CCR App. II, SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	☐
STLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	22 CCR App. II, SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	☐
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	☐
Wastewater Unpreserved ☐ Preserved with HNO_3 pH < 2 ☐	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.7	ICP-OES	0.020 mg/L (ppm)	☐
Drinking Water Unpreserved ☐ Preserved with HNO_3 pH < 2 ☐	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	☐
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.5	ICP-OES	0.003 mg/L (ppm)	☐
TSP/SPM Filter	40 CFR Part 50	ICP-OES	12 µg/filter	☐
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	☐
Other:				☐

Name of Sampler: S Crandall **Signature of Sampler:**

Sample #	Location	Volume/Area	Date/Time Sampled
LBP 1	AQUA BLUE PIPE D2-D3		1/28/20
LBP 2	LT BLUE PIPE ASSBLY D2		

Client Sample #s -

Total # of Samples:

Relinquished (Client):	[signature]	**Date:**		**Time:**	
Received (Lab):		**Date:**	1/30/2020	**Time:**	10:10

Comments: LCU PLANT DEMO

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*:

342001703

EMSL ANALYTICAL, INC.
3303 PARKWAY CENTER COURT
ORLANDO, FLORIDA 32808

PHONE: (407) 599-5887
FAX: (407) 599-9063

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
LBP 3	Brown Pipe Assembly D4		1/28/20

***Comments/Special Instructions:**

EMSL Analytical, Inc.
3303 PARKWAY CENTER COURT, Orlando, FL 32808
Phone/Fax: (407) 599-5887 / (407) 599-9063
http://www.EMSL.com orlandolab@emsl.com

EMSL Order:	342001703
CustomerID:	HSES34
CustomerPO:	11207990
ProjectID:	LCU Plant Demolitio

Attn: **Scott Crandall**
GHD
2675 Winkler Ave
Suite 180
Fort Myers, FL 33901

Phone: (239) 936-0789
Fax:
Received: 01/30/20 10:10 AM
Collected: 1/28/2020

Project: **Ft Myers Beach WWTP 11207990**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Weight*	*Lead Concentration*
LBP 1	*342001703-0001*	1/28/2020	1/31/2020	0.2614 g	<80 ppm
	Site: Aqua Blue Pipe D2-D3				
LBP 2	*342001703-0002*	1/28/2020	1/31/2020	0.2923 g	19000 ppm
	Site: Lt Blue Pipe Assbly D2				
LBP 3	*342001703-0003*	1/28/2020	1/31/2020	0.3133 g	<80 ppm
	Site: Brown Pipe Assbly D4				

Carlos Rivadeneyra, Laboratory Director
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the results, it will be noted on the reoprt. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Orlando, FL AIHA-LAP, LLC--ELLAP Accredited #163563

Initial report from 02/04/2020 16:58:45

ATTACHMENT D
PCB Analytical Laboratory Results

Project 11207990

Environmental Chemistry
Chain of Custody

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

EMSL Order Number (*Lab Use Only*): 012001055

PHONE:
FAX:

Report To Contact Name: Scott Crandall		**Bill To Company:** SAME	
Company Name: GHD Services		**Attention To:**	
Street: 5904 Hampton Oaks Pkwy		**Street:**	
City: Tampa	**State/Province:** FL	**Zip/Postal Code:** 33610	**City:** **State/Province:** **Zip/Postal Code:**
Phone: 813-335-5341 **Fax:**			**Phone:** **Fax:**
Project Name: Ft Myers Beach WWTP	Proj # 11207990	**Email Results To:** Scott.Crandall@GHD.com	**Purchase Order:**
U.S. State where Samples Collected: FL		**Number of Samples in Shipment:** 1	**Date of Shipment:** 1/29/20
Sample for Compliance? Yes ☒ No ☑ **If yes, NPDES?** ☐ **Other (Specify):**		**PWS ID #:**	**State Reporting Required? (Y/N)** No
Samples Collected by: EMSL ☐ **Client** ☑ check one		**Sampled By (Signature):** Scott Crandall	**Samples Received Chilled? (Y/N)** No
Standard Turnaround Time: ☑ 2 Weeks		**The following TATs are subject to lab approval:** ☐ 1 Week ☐ 4 Days ☐ 3 Days ☐ 2 Days ☐ 1 Day	

Failure to complete will hinder processing of samples

Client Sample ID	Comp	Grab	Collect Date/Time	Matrix (W=Water S=Soil A=Air SL=Sludge O= Other)	Preservative (1=HCL 2=HNO3 3=H2SO4 4=ICE 5=Other)	List Test(s) Needed: PCB				Field pH	Field pH Test Time	Field Temp. Deg C	Field Temp. Test Time	Comments
PCB1	☐	☑	1/28/20 1:20	O	None	✓								
	☐	☐												
	☐	☐												
	☐	☐												
	☐	☐												

Released By (Signature)	Date & Time	Received By	Date & Time
Scott Crandall	1/29/20 4:00	Barbara Curtis	1/30/20 9:30a

Please indicate reporting requirements: ☐ Results Only ☑ Results and QC ☐ Reduced Deliverables ☐ Disk Deliverable ☐ Other _____

Instructions or Comments: 2CU Demo — email for certs 1/30BC

Note: Field pH and Field Temperature are tested on the same day as the date of sample collection. **(Lab) Received Temperature:** 19.3 °C

Per email no certs needed and use HSL534 for login code. COC has wrong address 1/30 BC

Page 1 Of 1

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn: **Scott Crandall**
GHD
2675 Winkler Ave
Suite 180
Fort Myers, FL 33901
Phone: (239) 936-0789
Fax:

2/13/2020

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 1/30/2020. The results are tabulated on the attached data pages for the following client designated project:

Project ID: LCU Plant Demolitions
Ft Myers Beach WWTP Proj#11207990

The reference number for these samples is EMSL Order #012001055. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Approved By:

Phillip Worby, Environmental Chemistry
Laboratory Director

The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, CA ELAP 1877

EMSL Analytical does not hold SHW certification in the state of Florida.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 858-4571
http://www.EMSL.com EnvChemistry2@emsl.com

EMSL Order:	012001055
CustomerID:	HSES34
CustomerPO:	
ProjectID:	LCU Plant Demoliti

Attn: **Scott Crandall**
GHD
2675 Winkler Ave
Suite 180
Fort Myers, FL 33901

Phone: (239) 936-0789
Fax:
Received: 01/30/20 9:30 AM

Project: **Ft Myers Beach WWTP Proj#11207990**

Analytical Results

Client Sample Description PCB-1 ***Collected:*** 1/28/2020 1:20:00 AM ***Lab ID:*** *012001055-0001*

Method	*Parameter*	*Result*	*RL*	*Units*	*Prep Date & Analyst*		*Analysis Date & Analyst*	
GC-SVOA								
3546/8082A	Aroclor-1016	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH
3546/8082A	Aroclor-1221	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH
3546/8082A	Aroclor-1232	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH
3546/8082A	Aroclor-1242	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH
3546/8082A	Aroclor-1248	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH
3546/8082A	Aroclor-1254	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH
3546/8082A	Aroclor-1260	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH
3546/8082A	Aroclor-1262	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH
3546/8082A	Aroclor-1268	ND D	1.0	mg/Kg	2/3/2020	RS	02/03/20 0:00	EH

Definitions:

MDL - method detection limit
J - Result was below the reporting limit, but at or above the MDL
ND - indicates that the analyte was not detected at the reporting limit
RL - Reporting Limit (Analytical)
D - Dilution Sample required a dilution which was used to calculate final results

ATTACHMENT E
Asbestos Certification

RICK SCOTT, GOVERNOR

JONATHAN ZACHEM, SECRETARY

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

ASBESTOS LICENSING UNIT

THE ASBESTOS CONSULTANT - ENGINEER HEREIN IS LICENSED UNDER THE PROVISIONS OF CHAPTER 469, FLORIDA STATUTES

CRANDALL, SCOTT S

DIVERSIFIED PROFESSIONAL SERVICES CORP
3600 10TH ST NE
ST PETERSBURG FL 33704

LICENSE NUMBER: EA0000060

EXPIRATION DATE: NOVEMBER 30, 2020

Always verify licenses online at MyFloridaLicense.com

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Vern Roberts Environmental Training, Inc.

13987 94th Avenue N Seminole, FL 33776

727-239-1445

Asbestos Survey & Mechanical (inspector) Refresher Training

This is to Certify that

Scott Crandall

Has completed the requisite training for asbestos accreditation under TSCA TITLE II

Date of Examination 8/18/2019

Date of Course: 8/18/2019 Expiration Date 8/18/2020

Certificate # 08181902AM

Course # FL49-0006322 Provider # FL49-0003810

Instructor

February 25, 2020 Reference No. 11207990-01

Delivered via Electronic Mail

Lee County Utilities
1500 Monroe Street
Fort Myers, FL 33901

Re: **Asbestos NESHAP Demolition, Lead-Based Paint, and PCB Caulking Survey**
Waterway Estates WTP
4298 St. Clair Avenue
North Ft. Myers, Florida 33903

1. Introduction

GHD Services Inc. (GHD) was retained by Lee County Utilities (LCU) to conduct Asbestos-Containing Materials (ACM), Lead-Based Paint (LBP), and Polychlorinated Biphenyl (PCB)-containing caulking surveys of select facilities at the Waterway Estates Water Treatment Plant (WWE WTP) located at 4298 St. Clair Avenue in North Fort Myers, Florida. The surveys were performed to provide information concerning the potential presence of ACM, LBP, and PCB-caulking that may be disturbed during the demolition of select facilities at the WWE WTP. See Figure 1.

GHD conducted the asbestos survey in general accordance with the National Emissions Standard for Hazardous Air Pollutants (NESHAP) and the U.S. Environmental Protection Agency (EPA). The survey was conducted on January 28, 2020 by EPA certified asbestos inspector Mr. Scott Crandall, PE, FLAC of GHD (applicable EPA and State of Florida licenses/certificates can be found in the attachments to this report). The LBP survey was performed in general accordance with American Standards for Testing and Measuring (ASTM) E2119 *Practice for Quality Systems for Conducting In Situ Measurements of Lead Content in Paint or Other Coatings Using Field-Portable X-Ray Fluorescence (XRF) Devices* and E1727 *Practice for Field Collection of Soil Samples for Subsequent Lead Determination*. The PCB caulking survey was performed in accordance with generally accepted industry standards. This Asbestos, Lead-Based Paint and PCB Survey Report was produced for the exclusive use of Lee County Utilities.

The purpose of the survey was to identify, locate, and quantify suspect ACM, LBP and PCB containing materials which may be located throughout the select facilities scheduled for demolition. It is GHD's understanding that select structures and processing equipment are to be demolished or removed from the site. During the survey, suspect ACM and suspect PCB-containing materials were sampled for laboratory analysis. LBP screening was performed in the field using a hand held Niton® X-ray fluorescence (XRF) analyzer. Confirmation sampling of LBP was performed via laboratory testing.

1.1 General Buildings / Property Description

The property is a former municipal water treatment plant site. Select facilities are no longer used by LCU and have been placed out-of-service (i.e. abandoned), including, but limited to, steel and concrete treatment and storage tanks, a clarifier, filters, process equipment and associated piping, and various storage buildings. Figure

GHD Services Inc.
Winkler Avenue Suite 180 Fort Myers Florida 33901 USA
T 239 936 4003 F 239 936 0819 www.ghd.com

1, Site Plan, illustrates the location of the various components arbitrarily identified from D-1 to D-17 for clarity in identifying the select components scheduled for demolition and included in this study.

2. Inspection, Screening, and Sample Collection

Asbestos survey and sampling procedures conducted by GHD were performed in general accordance with the NESHAP regulation and the guidelines published by the EPA in 40 CFR Part 763 Subpart E. The LBP survey was conducted in general accordance with the applicable ASTM standards. No specific standard exists for the inspection of industrial facilities for PCB-containing caulking. These inspections were performed in accordance with generally accepted industry standards.

2.1 Homogeneous Material Classifications

An initial walk-through visual inspection was conducted to determine the presence, locations and condition of suspect materials that were accessible and/or exposed in the area of facilities scheduled for demolition. Building materials that were similar in general appearance were grouped into “homogeneous” sampling areas as termed by the EPA.

Following the EPA visual inspection protocol, each identified suspect homogeneous material was placed in one of the following EPA classifications:

- **Surfacing Materials** (sprayed or trowel applied to building members)
- **Thermal System Insulation** (materials generally applied to various mechanical systems)
- **Miscellaneous Materials** (any materials which do not fit either of the above categories)

2.2 Sampling Procedures

Following the visual inspection, sampling locations were chosen and samples collected to be representative of each homogeneous material. Quantities of accessible and/or exposed building materials that were suspected of containing asbestos, LBP, or PCB-caulking were estimated by taking approximate measurements in the field. Samples of each type of suspect material identified were placed in uniquely numbered sample containers. The materials where cataloged on the appropriate field sampling form and recorded on the laboratory Chain-of-Custody (COC) form for transmission to the laboratory.

2.3 XRF Lead Screening

Field screening of suspect lead-based paint was performed on painted surfaces of select facilities scheduled for demolition using a hand-held Niton® X-ray fluorescence (XRF) analyzer. An XRF is a non-destructive instrument that emits an x-ray to excite atoms of the materials being tested. The excited atoms release electrons and energy which is measured as florescence. This florescence is unique to each element and allows the level of lead in a painted surface to be quantified. Locations and characteristics of the lead screening results were recorded. The results are provided in Appendix C. Materials with greater than 1 milligrams per centimeter squared (mg/cm^2) are defined as lead containing paints (i.e. LBP). Confirmation samples were collected from several locations that tested positive for lead (i.e. XRF reading greater than 1 mg/cm^2) and sent to the laboratory for analysis.

3. Laboratory Analyses

All samples collected during this survey for analysis of asbestos or lead, as applicable, were sent, under COC, to EMSL Analytical, Inc. (EMSL), located in Orlando, Florida. All samples collected for analysis of PCBs were sent to the EMSL laboratory in Cinnaminson, New Jersey. EMSL is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP). Their NVLAP Laboratory Number is 101151-0. EMSL is also accredited under the Environmental Lead Laboratory Accreditation Programs (ELLAP). The ELLAP approval is 163563.

3.1 Method of Analysis - Asbestos

The bulk samples collected for analysis of asbestos were analyzed by polarized light microscopy (PLM) utilizing EPA 600/R-93/116 visual estimation method. The laboratory mounts the samples on slides and then analyzes the samples for the following: asbestos (i.e., chrysotile, amosite, crocidolite, anthophyllite, and actinolite/tremolite), fibrous non-asbestos constituents (i.e., mineral wool, paper, etc.), and non-fibrous constituents. Refractive indices, morphology, color, pleochroism, birefringence, extinction characteristics, and signs of elongation are used to identify asbestos. The same characteristics are used to identify the non-asbestos constituents. The microscopist visually estimates the relative amounts of each constituent by determining the volume of each constituent in proportion to the total volume of the sample using a stereoscope. The EPA considers a homogeneous material to be asbestos containing if at least one sample of this material is greater than one percent (1%) asbestos. Conversely, EPA considers a homogeneous material to be non-asbestos containing if all the samples of that material contain 1% or less asbestos. When samples analyzed by PLM contain asbestos in amounts less than ten percent (< 10%), a more exact method of analysis called point counting may be performed at the client's request. The EPA point count method allows a sample in which asbestos was visually detected, but which is visually estimated to have 10% or less asbestos, to be quantified using a point count procedure. If not point counted, a sample in which asbestos was visually detected and estimated (including trace to ≤1%) must be assumed to be greater than 1% and treated as an ACM. The EPA point counting procedure is as follows: an ocular reticule (cross hair or point array) is used to visually superimpose a point or points on the microscope field of view. A total of 400 points superimposed on either asbestos fibers or non-asbestos matrix material must be counted over at least eight different preparations of representative sub-samples. If an asbestos fiber and matrix particle overlap so that a point is superimposed on their visual intersection, a point is scored for both categories. Point counting provides a quantification of the area percent asbestos. Per EPA's regulations, materials which have been point-counted and, therefore, quantitatively determined to have less than or equal to one percent (≤1%) asbestos, can be treated as non-ACM. No samples were point counted as part of this survey.

3.2 Method of Analysis – LBP

Based on the findings of the XRF screening, paint chip samples were collected from areas of suspected LBP and were analyzed by EPA method SW846 7000B Flame Atomic Absorption (FAA). The laboratory results are presented in percent by weight.

Two (2) paint chip samples were collected for laboratory analysis.

3.3 Method of Analysis - PCBs

The samples collected from suspected PCB-caulkings were analyzed by EPA method SW846 8082A, by Gas Chromatography. The analytical results are reported in milligrams per kilogram (mg/Kg) or ppm.

4. Observations and Findings

4.1 Asbestos

A total of eight (8) samples were collected from select facilities scheduled for demolition. No materials were assumed to contain asbestos. The following table lists each material sampled, sample locations, approximate quantity of ACMs located throughout the surveyed area (if any revealed based on laboratory analyses), percentage and type of asbestos fibers found in the material sampled (if any revealed based on laboratory analyses), and the NESHAP Category (if applicable) of the sampled material. A copy of the asbestos laboratory analytical results can be found in **Attachment A.**

Asbestos Sample Results				
Sample No.	Material Description	Location	Asbestos / Type	NESHAP Category(3)
1	Rolled Asphalt Roofing with insulation	D10 Roof	None Detected	NA
2	Black Mastic on Roof	D-10 Roof	None Detected	NA
3	Tank Surface Coating	D-12 interior of Acid Tank	None Detected	NA
4	Gray Roofing Shingles	D-15 Roof	None Detected	NA
5	Red Pipe Gaskets	D-3 Pipe Assembly	None Detected	NA
6	Red Pipe Gaskets	D-6 Pipe Assembly	None Detected	NA
7	Red Pipe Gaskets	D-9 Pipe Assembly	None Detected	NA
8	White Pipe Gaskets	D-3 Pipe Assembly	None Detected	NA

NA – Not Applicable

Based on the visual inspection and samples collected and analyzed, no ACMs were identified at the select facilities scheduled for demolition at the WWE WTP.

4.2 Lead-Based Paint

GHD conducted the LBP Screening in general accordance with ASTM Standards. The results of the XRF screening are provided in **Attachment B**. A total of thirty-seven (37) field screening tests were performed with the XRF. Four (4) test results indicated the presence of lead above the EPA standard of 1 mg/cm^2.

Two (2) confirmation samples were collected for laboratory analysis. A copy of the LBP laboratory results can be found in **Attachment C**. A summary of the laboratory confirmation testing of LBP samples is summarized in the following table.

Suspect LBP Sampling Analytical Results				
Sample No.	Location	Substrate	Color	Sample Result ppm
LBP-1	Piping on D-6 Clarifier	Steel Pipe	Brown	53,000
LBP-2	Loading Arm (D16)	Steel Pipe	Brown	64,000

The EPA Standard for lead based paint is 5,000 ppm or 1 mg/cm^2. **Based on the visual inspection, XRF field screening, and samples collected, LBPs were identified on select facilities at the WWE WTP.**

4.3 Polychlorinated Biphenyls (PCB)-containing materials

Based on the visual inspection, no suspect PCB-containing materials were identified at select facilities scheduled for demolition at the WWE WTP.

5. Conclusions and Recommendations

5.1 Asbestos Containing Materials

Based on visual inspection and the samples collected, no ACM was identified at the select facilities scheduled for demolition at the WWE WTP.

5.2 Lead-Based Paint Materials

Lead based paints were identified at the site in both the XRF field screenings and the laboratory testing. LBPs were identified in three areas at the facility. The first was the brown piping on the front and back of the (D-6) Clarifier tank (Photos 1 and 2). Sample LBP-1 taken from the vertical pipe shown in Photo 1 below, has a lead concentration of 53,000 ppm.

Photo 1. Brown Pipe with LBP rfont of Clarifier

Photo 2. Brown LBP Pipe rear of Clarifier

Lead based paint was detected with the XRF on the brown piping on the D-3, the lime thickening basin. The XRF showed a reading of 2.97 mg/cm^2. The area is shown in Photo 3. Finally, LBP was detected on the piping of the loading arm (Photo 4), located at south side of the facility. The loading arm (D16) sample, LBP-2, has a lead concentration of 64,000 ppm, as determined by laboratory analysis.

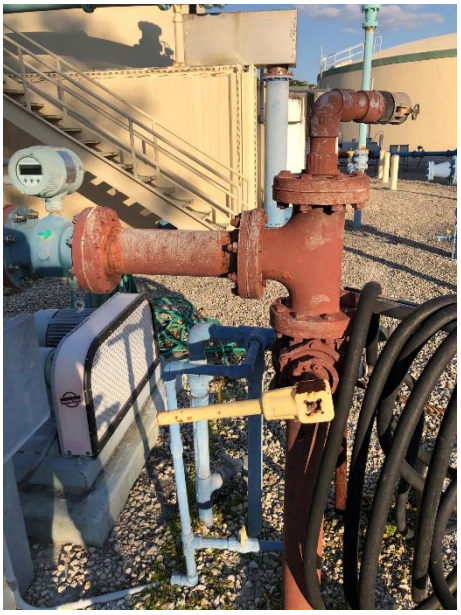


Photo 3. - Brown LBP on D-3 Piping

Photo 4. Truck Loading Arm (D16)

These LBP findings should be provided to contractors working on the demolition so that proper worker protections can be established. OSHA established the Lead Standard for the Construction Industry, 29 CFR 1926.62, which applies to all construction work where an employee may be exposed to lead. These exposures include demolition and salvage of structures where lead or material containing lead are present. The standard defines the occupationally permissible exposure limit and specific requirements for construction work with lead-containing materials. OSHA does not have a percentage lead-in-paint action level in the current construction lead standard. OSHA regulations are driven by airborne lead exposure to workers. OSHA considers the lead regulation enforceable if the presence of *any* lead in paint at detectable concentrations is present when demolition or renovation activities are performed.

Scrap metal that is sent for recycling is not a waste and thus exempt from the hazardous waste determinations requirements. Scrap metal with LBP can be sent for recycling.

5.3 Polychlorinated Biphenyls (PCB)-Containing Materials

Based on visual inspection and sampling conducted, no caulking suspected of containing PCBs was identified at the select facilities scheduled for demolition at the WWE WTP.

6. Closing

If, during the demolition, any additional suspect materials that have not been evaluated in this report are encountered, or if any materials are found that were not visible at the time of the survey, these materials should be not be disturbed and GHD should be contacted to further evaluated the materials.

Please contact us at (813) 971-3882 if you have any questions.

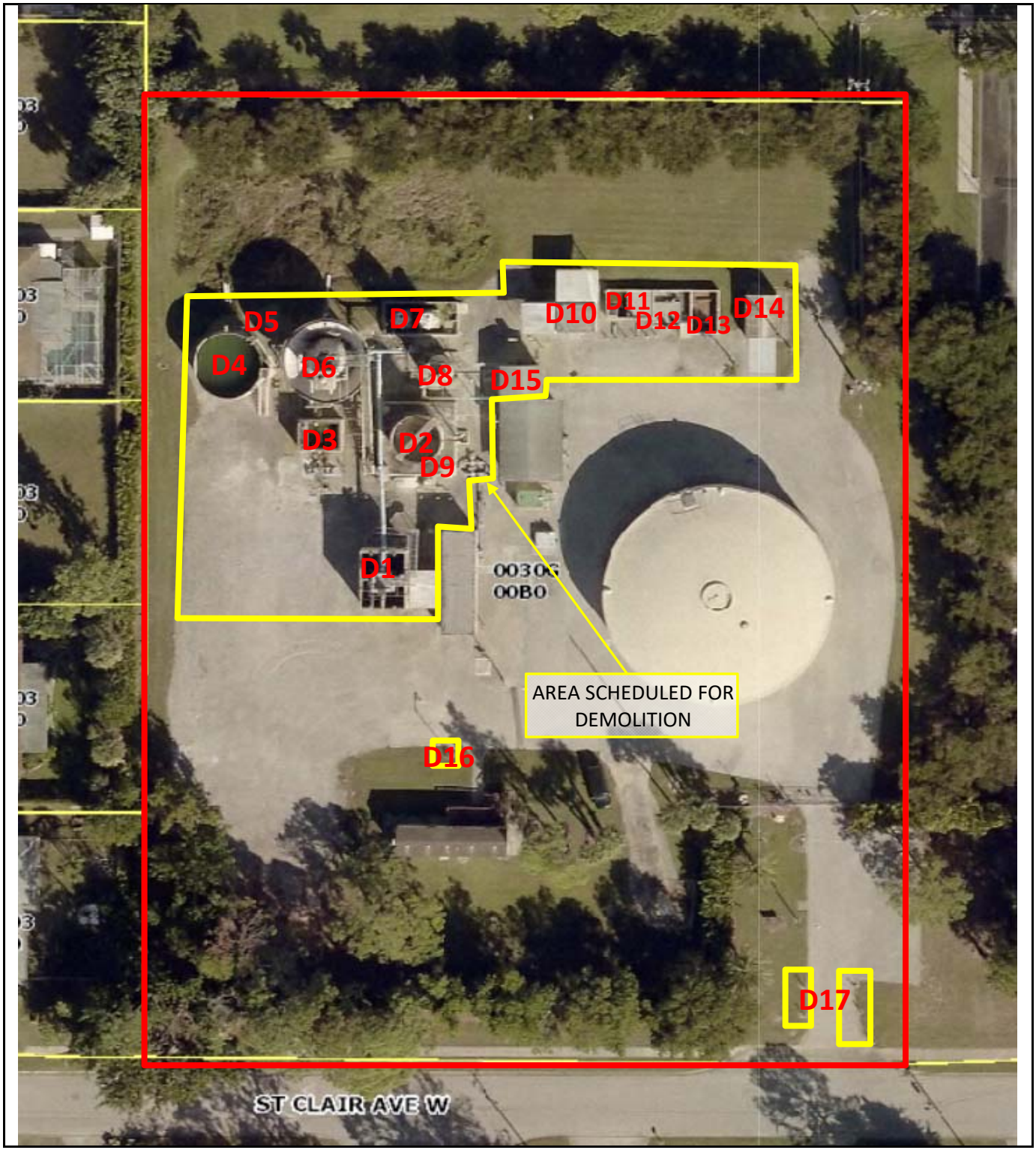
Sincerely,
GHD Services, Inc.
Asbestos Business License No. ZA338

Scott Crandall, PE,
Florida Licensed Asbestos Consultant
License No. EA000060

Attachments

Figure 1	Site Plan
Attachment A	Laboratory Analytical Results – Asbestos
Attachment B	XRF Screening Results
Attachment C	Laboratory Analytical Results – Lead-Based Paint
Attachment D	Asbestos Certifications

Figure 1
Site Plan



SOURCE: LEE COUNTY PROPERTY APPRAISER WEBSITE.

WATERWAY ESTATES WATER TREATMENT PLANT
4276 ST CLAIR AVENUE W
NORTH FORT MYERS, LEE COUNTY, FLORIDA 33903

11207990

13-Feb-20

SITE PLAN - WATERWAY ESTATES WTP

FIGURE NO. 1

ATTACHMENT A
Asbestos Laboratory Analytical Results

OrderID: 342001776

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 342001776

EMSL ANALYTICAL, INC.
3303 PARKWAY CENTER COURT
ORLANDO, FLORIDA 32808

PHONE: (407) 599-5887
FAX: (407) 599-9063

Company : GHD SERVICES	**EMSL-Bill to:** ☒ Same ☐ Different If Bill to is Different note instructions in Comments**
Street: 5904 Hampton Oaks Pkwy	*Third Party Billing requires written authorization from third party*
City: Tampa / **State/Province: FL**	**Zip/Postal Code: 33610** / **Country:**
Report To (Name): Scott Crandall, PE	**Fax #:**
Telephone #: 813-335-5341	**Email Address: scott.crandall@ghd.com**
Project Name/Number: WATER WAY ESTATES ~~WWTP~~ WTP SRC 1/21/20	11207990
Please Provide Results: ☐ Fax ☒ Email / **Purchase Order:**	**U.S. State Samples Taken:** FL

Turnaround Time (TAT) Options* – Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☒ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air
- ☐ NIOSH 7400
- ☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
- ☒ PLM EPA 600/R-93/116 (<1%)
- ☐ PLM EPA NOB (<1%)

Point Count
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)

Point Count w/Gravimetric
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)
- ☐ NYS 198.1 (friable in NY)
- ☐ NYS 198.6 NOB (non-friable-NY)
- ☐ NIOSH 9002 (<1%)

TEM – Air ☐ 4-4.5hr TAT (AHERA only)
- ☐ AHERA 40 CFR, Part 763
- ☐ NIOSH 7402
- ☐ EPA Level II
- ☐ ISO 10312

TEM - Bulk
- ☐ TEM EPA NOB
- ☐ NYS NOB 198.4 (non-friable-NY)
- ☐ Chatfield SOP
- ☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
- Fibers >10µm ☐ Waste ☐ Drinking
- All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
- ☐ Microvac - ASTM D 5755
- ☐ Wipe - ASTM D6480
- ☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
- ☐ PLM CARB 435 - A (0.25% sensitivity)
- ☐ PLM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - C (0.01% sensitivity)
- ☐ EPA Protocol (Semi-Quantitative)
- ☐ EPA Protocol (Quantitative)

Other:
- ☐

☐ **Check For Positive Stop – Clearly Identify Homogenous Group**

Samplers Name: SCOTT CRANDALL **Samplers Signature:**

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
1	ROLLED ROOFING W/ INSULATION		1/28/20
2	BLACK ROOF MASTIC @ LIGHTNG RODS		
3	SURFACE COATING ACID TANK		
4	GRAY ROOF SHINGLES W/ TAR PAPER		
5	RED PIPE GASKETS		
6	RED PIPE GASKET		
7	RED PIPE GASKET		
8	WHITE PIPE GASKET		

Client Sample # (s): 1-8 **Total # of Samples:** 8

Relinquished (Client): **Date:** 1/28/20 **Time:** 4:00

Received (Lab): **Date:** 1/30/2020 **Time:** 10:10

Comments/Special Instructions:
LCU Plant Demo

Controlled Document – Asbestos COC – R2 – 1/12/2010

EMSL Analytical, Inc.

3303 PARKWAY CENTER COURT Orlando, FL 32808

Tel/Fax: (407) 599-5887 / (407) 599-9063

http://www.EMSL.com / orlandolab@emsl.com

EMSL Order:	342001776
Customer ID:	HSES34
Customer PO:	11207990
Project ID:	LCU Plant Demolitions

Attention:	Scott Crandall	**Phone:**	(239) 936-0789
	GHD	**Fax:**	
	2675 Winkler Ave	**Received Date:**	01/31/2020 10:10 AM
	Suite 180	**Analysis Date:**	02/03/2020
	Fort Myers, FL 33901	**Collected Date:**	01/28/2020
Project:	Water Way Estates WTP (LCU Plant Demolitions)		

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1-Roofing *342001776-0001*	Rolled Roofing W/Insulation	Black Fibrous Heterogeneous	10% Synthetic	90% Non-fibrous (Other)	None Detected
1-Insulation *342001776-0001A*	Rolled Roofing W/Insulation	Brown Fibrous Homogeneous	65% Cellulose	35% Non-fibrous (Other)	None Detected
2 *342001776-0002*	Black Roof Mastic @ Lighting Rows	Black Fibrous Homogeneous	75% Cellulose	25% Non-fibrous (Other)	None Detected
3 *342001776-0003*	Surface Coating Acid Tank	Gray/Green Non-Fibrous Heterogeneous		15% Ca Carbonate 85% Non-fibrous (Other)	None Detected
4-Shingle *342001776-0004*	Gray Roof Shingles W/Tar Paper	Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
4-Tar Paper *342001776-0004A*	Gray Roof Shingles W/Tar Paper	Black Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
5 *342001776-0005*	Red Pipe Gaskets	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
6 *342001776-0006*	Red Pipe Gaskets	Red/Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7 *342001776-0007*	Red Pipe Gaskets	Red/Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8 *342001776-0008*	White Pipe Gaskets	White/Green Non-Fibrous Homogeneous	3% Synthetic 12% Wollastonite	85% Non-fibrous (Other)	None Detected

Analyst(s)

Nashira McCall (10)

Carlos Rivadeneyra, Laboratory Director
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Orlando, FL NVLAP Lab Code 101151-0

Report amended: 03/05/2020 14:28:10 Replaces initial report from: 02/04/2020 08:53:16 Reason Code: Client-Change to Project

ATTACHMENT B
XRF Lead Screening Results

XRF Lead ScreeningA1:D28 Results			
Sample No.	Paint Color Item/Substrate	Location	XRF Reading mg/cm^2
1	Calibration Check	Standard 1.04	1.01
2	Tan Pain on Shed	D14	<0.01
3	Green Trim on Shed	D14	<0.01
4	Tan Paint on Concrete Tank	D12	<0.01
5	Red Paint on Concrete Interior	D12	<0.01
6	Tan Paint on Concrete Tank	D11	<0.01
7	Lt Green Paint on Concrete Tank	D11	<0.01
8	Tan Paint on Concrete	D10	<0.01
9	Green Door Paint	D10	<0.01
10	Blue interior on Block	D10	<0.01
11	White Interior on Block	D10	<0.01
12	Tan Exterior on Metal	D15	<0.01
13	White Interior on Metal	D15	<0.01
14	Tan Paint on Containment wall	D8	<0.01
15	Tan Paint on Containment wall	D7	<0.01
16	Tan Paint on Clairifer	D6	<0.01
17	**Dark Brown Pipe - Front**	**D6**	**2.51**
18	Lite Green Pipe	D6	<0.01
19	**Dark Brown Pipe - Rear**	**D6**	**2.71**
20	Lite Brown Pipe	D4	<0.01
21	Grey Paint on Motors	D4	<0.01
22	Tan Paint on Metal Tank	D4	<0.01
23	Tan Paint on Tank	D3	<0.01
24	**Brown Pipe**	**D3**	**2.97**
25	Grey Paint on Motors	D3	<0.01
26	Blue Pipe	D2	<0.01
27	Aqua Green Pipe	D2	<0.01
28	Blue Pipe	D2	<0.01
29	Bright Blue Pipe	D2	<0.01
30	Grey Paint on Motors	D2	<0.01
31	Redish Brwon Pipe	D2	<0.01
32	Tan Paint on Concrete	D2	<0.01
33	Tan Paint on Tank	D2	<0.01
34	Tan Paint on Block	D1	<0.02
35	Blue Pipe	D1	<0.01
36	Aqua Green Pipe	D1	<0.01
37	**Brown Paint on Loading Arm**	**Loading Arm**	**3.01**

LBP Standard = 1 mg/cm2

ATTACHMENT C
LEAD Analytical Laboratory Results

OrderID: 342001695

Lead (Pb) Chain of Custody

EMSL Order ID *(Lab Use Only)*: 342001695

EMSL ANALYTICAL, INC.
3303 PARKWAY CENTER COURT
ORLANDO FL 32808
PHONE: (407) 599-5887
FAX: (407) 599-9063

Company : GHD SErvices	**EMSL-Bill to:** ☒ Same ☐ Different If Bill to is Different note instructions in Comments**
Street: 5904 Hampton Oak Parkway	*Third Party Billing requires written authorization from third party*
City: Tampa **State/Province: FL**	**Zip/Postal Code: 33610** **Country: US**
Report To (Name): scott crandall	**Telephone #: 8133355341**
Email Address: scott.crandall@ghd.com WTP 3/7/20	**Fax #:** **Purchase Order:**
Project Name/Number: WATER WAY ESTATES ~~WWTP~~ 11207990	**Please Provide Results:** ☐ Fax ☒ Email
U.S. State Samples Taken: 5	**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour | ☐ 6 Hour | ☐ 24 Hour | ☐ 48 Hour | ☐ 72 Hour | ☒ ~~96~~ Hour | ☐ 1 Week | ☐ 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix	Method	Instrument	Reporting Limit	Check
Chips ☐ % by wt. ☐ mg/cm² ☒ ppm (mg/kg)	SW846-7000B	Flame Atomic Absorption	0.01%	☒
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	☐
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	☐
	NIOSH 7300M/NIOSH 7303	ICP-OES	0.5 µg/filter	☐
Wipe* ASTM ☐ non ASTM ☐ *If no box checked, non-ASTM Wipe assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	☐
	SW846-6010B or C	ICP-OES	1.0 µg/wipe	☐
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-1311/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	☐
SPLP	SW846-1312/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-1312/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	☐
TTLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	22 CCR App. II, SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	☐
STLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	22 CCR App. II, SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	☐
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	☐
Wastewater Unpreserved ☐ Preserved with HNO_3 pH < 2 ☐	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.7	ICP-OES	0.020 mg/L (ppm)	☐
Drinking Water Unpreserved ☐ Preserved with HNO_3 pH < 2 ☐	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	☐
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.5	ICP-OES	0.003 mg/L (ppm)	☐
TSP/SPM Filter	40 CFR Part 50	ICP-OES	12 µg/filter	☐
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	☐
Other:				☐

Name of Sampler: S Crandall **Signature of Sampler:**

Sample #	Location	Volume/Area	Date/Time Sampled
LBP 1	Dark Brown Rae @ Clarifier		1/28/20
LBP 2	Dark Brown Rae @ Loading Arm		1/28/20

Client Sample #s -2- **Total # of Samples:** 2

Relinquished (Client): Scott Crandall **Date:** 1/28/20 **Time:** 4pm

Received (Lab): [illegible] **Date:** 1/29/1 **Time:** 10:10

Comments: FAX 1/30/2020 HB

LCU Plant Demo

EMSL Analytical, Inc.
3303 PARKWAY CENTER COURT, Orlando, FL 32808
Phone/Fax: (407) 599-5887 / (407) 599-9063
http://www.EMSL.com orlandolab@emsl.com

EMSL Order:	342001695
CustomerID:	HSES34
CustomerPO:	11207990
ProjectID:	LCU Plant Demolitio

Attn: **Scott Crandall**
GHD
2675 Winkler Ave
Suite 180
Fort Myers, FL 33901

Phone: (239) 936-0789
Fax:
Received: 01/30/20 10:10 AM
Collected: 1/28/2020

Project: **Waterway Estates WTP 11207990**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Weight*	*Lead Concentration*
LBP 1	*342001695-0001*	1/28/2020	1/31/2020	0.3026 g	53000 ppm
	Site: Dark Brown Pipe @ Clarifier				
LBP 2	*342001695-0002*	1/28/2020	1/31/2020	0.2983 g	64000 ppm
	Site: Dark Brown Pipe @ Loading Area				

Carlos Rivadeneyra, Laboratory Director
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the results, it will be noted on the reoprt. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Orlando, FL AIHA-LAP, LLC--ELLAP Accredited #163563

Report Amended: 03/05/2020 15:25:13 Replaces the Inital Report 02/04/2020 16:54:10. Reason Code: Client-Change to Project

ATTACHMENT D
Asbestos Certification

Project 11207990

RICK SCOTT, GOVERNOR

JONATHAN ZACHEM, SECRETARY

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

ASBESTOS LICENSING UNIT

THE ASBESTOS CONSULTANT - ENGINEER HEREIN IS LICENSED UNDER THE PROVISIONS OF CHAPTER 469, FLORIDA STATUTES

CRANDALL, SCOTT S

DIVERSIFIED PROFESSIONAL SERVICES CORP
3600 10TH ST NE
ST PETERSBURG FL 33704

LICENSE NUMBER: EA0000060

EXPIRATION DATE: NOVEMBER 30, 2020

Always verify licenses online at MyFloridaLicense.com

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Vern Roberts Environmental Training, Inc.

13987 94th Avenue N Seminole, FL 33776

727-239-1445

Asbestos Survey & Mechanical (inspector) Refresher Training

This is to Certify that

Scott Crandall

Has completed the requisite training for asbestos accreditation under TSCA TITLE II

Date of Examination 8/18/2019

Date of Course: 8/18/2019 Expiration Date 8/18/2020

Certificate # 08181902AM

Course # FL49-0006322 Provider # FL49-0003810

Instructor

APPENDIX B
Waste Characterization Forms and Waste Management Approvals

Project 11207990

WASTE MANAGEMENT

EZ Profile™

Requested Facility: Lee Hendry ☐ Unsure Profile Number: 411159FL

☐ Multiple Generator Locations (Attach Locations) ☐ Request Certificate of Disposal ☐ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Lee County Utilities - Fort Myers Beach WWTP
2. Site Address: 17155 Pine Ridge Rd
   (City, State, ZIP) Fort Myers FL 33931
3. County: Lee
4. Contact Name: Henry Barroso
5. Email: HBarroso@leegov.com
6. Phone: (239) 567-2182 7. Fax: _____
8. Generator EPA ID: _____ ☑ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ☑ SAME AS GENERATOR

1. Billing Name: Lee County Utilities - Fort Myers Beach WWTP
2. Billing Address: 17155 Pine Ridge Rd
   (City, State, ZIP) Fort Myers FL 33931
3. Contact Name: Henry Barroso
4. Email: HBarroso@leegov.com
5. Phone: (239) 567-2182 6. Fax: _____
7. WM Hauled? ☐ Yes ☐ No
8. P.O. Number: _____
9. Payment Method: ☐ Credit Account ☐ Cash ☐ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Material from process tanks at decommissioned WWTP
   Describe Process Generating Material: ☐ See Attached

Non-contaminated filter materials (e.g. sands/anthracite/gravels) remaining in process tank (i.e. filters) at the Fort Myers Beach (FMB) municipal wastewater treatment plant (WWTP) that have been out-of-service/decommissioned for several

2. Material Composition and Contaminants: ☐ See Attached

1. WWTP filter tank material ID D2 thru D6	100 %
2.	
3.	
4.	
Total comp. must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ☑ N/A
4. Color: varies
5. Physical State at 70˚F: ☑ Solid ☐ Liquid ☐ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ☐ Yes ☑ No Describe: _____
9. Flash Point: ☐ <140˚F ☐ 140˚–199˚F ☐ ≥200˚ ☑ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ☐ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ☐ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ☐ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ☐ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ☐ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ☐ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ☐ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ☐ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ☐ Yes ☑ No
   a. Regulated by 40 CFR 761? ☐ Yes ☐ No
   b. Remediation under 40 CFR 761.61 (a)? ☐ Yes ☐ No
   c. Were PCB imported into the US? ☐ Yes ☐ No
10. Regulated and/or Untreated Medical/Infectious Waste? ☐ Yes ☑ No
11. Contains Asbestos? ☐ Yes ☑ No
    → If Yes: ☐ Non-Friable ☐ Non-Friable – Regulated ☐ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes
   Please identify applicable samples and/or lab reports:

Sample IDs are FMBWWTP-D-2L and FMBWWTP-D-2U through FMBWWTP-D-6L and FMBWWTP-D-6U. Lab reports are AEL Report # F2000467 LCU PLANTS DEMO and Jupiter Report # 2066570.

2. Other information attached (such as MSDS)? ☐ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ☐ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 700
   ☐ Tons ☑ Yards ☐ Drums ☐ Gallons ☐ Other: _____
3. Container Type and Size: _____
4. USDOT Proper Shipping Name: ☑ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

☑ I am an Authorized Agent signing on behalf of the Generator, and I have confirmed with the Generator that information contained in this profile, as well as supporting documents provided, are accurate and complete.

Name (Print): Jennifer Rogers Date: 03/12/2020

Title: Project Engineer

Company: GHD Services, Inc.

Certification Signature

Jennifer Rogers

beFadb43ba...

THINK GREEN.®

QUESTIONS? CALL 800 963 4776 FOR ASSISTANCE

EZ Profile™ Addendum

Only complete this Addendum if prompted by responses on EZ Profile™ (page 1) or to provide additional information. Sections and question numbers correspond to EZ Profile™.

Profile Number: 411159FL

C. MATERIAL INFORMATION

Describe Process Generating Material (Continued from page 1): If more space is needed, please attach additional pages.

years and is scheduled for demolition.

Material Composition and Contaminants (Continued from page 1): If more space is needed, please attach additional pages.

5.	
6.	
7.	
8.	
9.	
Total composition must be equal to or greater than 100%	≥100%

D. REGULATORY INFORMATION

Only questions with a "Yes" response in Section D on the EZ Profile™ form (page 1) need to be answered here.

1. EPA Hazardous Waste
   a. Please list all USEPA listed and characteristic waste code numbers:
   b. Is the material subject to the Alternative Debris standards (40 CFR 268.45)? ❑ Yes ❑ No
   c. Is the material subject to the Alternative Soil standards (40 CFR 268.49)? → If Yes, complete question 4. ❑ Yes ❑ No
   d. Is the material exempt from Subpart CC Controls (40 CFR 264.1083)? ❑ Yes ❑ No
      → If Yes, please check **one** of the following:
      ❑ Waste meets LDR or treatment exemptions for organics (40 CFR 264.1082(c)(2) or (c)(4))
      ❑ Waste contains VOCs that average <500 ppmw (CFR 264.1082(c)(1)) – will require annual update.
2. State Hazardous Waste → Please list all state waste codes: _____
3. For material that is Treated, Delisted, or Excluded → Please indicate the category, below:
   ❑ Delisted Hazardous Waste ❑ Excluded Waste under 40 CFR 261.4 → Specify Exclusion: _____
   ❑ Treated Hazardous Waste Debris ❑ Treated Characteristic Hazardous Waste → If checked, complete question 4.
4. Underlying Hazardous Constituents → Please list all Underlying Hazardous Constituents:
5. Industries regulated under Benzene NESHAP include petroleum refineries, chemical manufacturing plants, coke by-product recovery plants, and TSDFs.
   a. Are you a TSDF? → If yes, please complete Benzene NESHAP questionnaire. If not, continue. ❑ Yes ❑ No
   b. Does this material contain benzene? ❑ Yes ❑ No
      1. If yes, what is the flow weighted average concentration? _____ ppmw
   c. What is your facility's current total annual benzene quantity in Megagrams? ❑ <1 Mg ❑ 1–9.99 Mg ❑ ≥10 Mg
   d. Is this waste soil from a remediation? ❑ Yes ❑ No
      1. If yes, what is the benzene concentration in remediation waste? _____ ppmw
   e. Does the waste contain >10% water/moisture? ❑ Yes ❑ No
   f. Has material been treated to remove 99% of the benzene or to achieve <10 ppmw? ❑ Yes ❑ No
   g. Is material exempt from controls in accordance with 40 CFR 61.342? ❑ Yes ❑ No
      → If yes, specify exemption: _____
   h. Based on your knowledge of your waste and the BWON regulations, do you believe that this waste stream is subject to treatment and control requirements at an off-site TSDF? ❑ Yes ❑ No
6. 40 CFR 63 GGGGG → Does the material contain <500 ppmw VOHAPs at the point of determination? ❑ Yes ❑ No
7. CERCLA or State-Mandated clean up → Please submit the Record of Decision or other documentation with process information to assist others in the evaluation for proper disposal. A "Determination of Acceptability" may be needed for CERCLA wastes not going to a CERCLA approved facility.
8. NRC or state regulated radioactive or NORM Waste → Please identify Isotopes and pCi/g: _____

WASTE MANAGEMENT

EZ Profile™

Requested Facility: Lee Hendry ❑ Unsure Profile Number: 411160FL

❑ Multiple Generator Locations (Attach Locations) ❑ Request Certificate of Disposal ❑ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Lee County Utilities - Fort Myers Beach WWTP
2. Site Address: 17155 Pine Ridge Rd
   (City, State, ZIP) Fort Myers FL 33931
3. County: Lee
4. Contact Name: Henry Barroso
5. Email: HBarroso@leegov.com
6. Phone: (239) 567-2182 7. Fax: _____
8. Generator EPA ID: _____ ☑ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ☑ SAME AS GENERATOR

1. Billing Name: Lee County Utilities - Fort Myers Beach WWTP
2. Billing Address: 17155 Pine Ridge Rd
   (City, State, ZIP) Fort Myers FL 33931
3. Contact Name: Henry Barroso
4. Email: HBarroso@leegov.com
5. Phone: (239) 567-2182 6. Fax: _____
7. WM Hauled? ❑ Yes ❑ No
8. P.O. Number: _____
9. Payment Method: ❑ Credit Account ❑ Cash ❑ Credit Card

C. MATERIAL INFORMATION

1. Common Name: WWTP chlorine contact towers residuals ID D8-D9
   Describe Process Generating Material: ❑ See Attached

Non-contaminated sediments (e.g. sands/scale) remaining in process tank (i.e. chlorine contact towers at the Fort Myers Beach (FMB) municipal wastewater treatment plant (WWTP) that have been out-of-service/decommissioned for several years

2. Material Composition and Contaminants: ❑ See Attached

1. chlorine contact tower residuals D8 and D9	100 %
2.	
3.	
4.	
Total comp. must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ☑ N/A
4. Color: varies
5. Physical State at 70˚F: ☑ Solid ❑ Liquid ❑ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ❑ Yes ☑ No Describe: _____
9. Flash Point: ❑ <140˚F ❑ 140˚–199˚F ❑ ≥200˚ ☑ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ❑ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ❑ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ❑ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ❑ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ❑ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ❑ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ❑ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ❑ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ❑ Yes ☑ No
   a. Regulated by 40 CFR 761? ❑ Yes ❑ No
   b. Remediation under 40 CFR 761.61 (a)? ❑ Yes ❑ No
   c. Were PCB imported into the US? ❑ Yes ❑ No
10. Regulated and/or Untreated Medical/Infectious Waste? ❑ Yes ☑ No
11. Contains Asbestos? ❑ Yes ☑ No
    → If Yes: ❑ Non-Friable ❑ Non-Friable – Regulated ❑ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes
   Please identify applicable samples and/or lab reports:

ample ID is FMBWWTP D-9. Lab reports are AEL Report # F2000467 LCU PLANTS DEMO and Jupiter Report # 2066571.

2. Other information attached (such as MSDS)? ❑ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ❑ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 2
   ❑ Tons ☑ Yards ❑ Drums ❑ Gallons ❑ Other: _____
3. Container Type and Size: _____
4. USDOT Proper Shipping Name: ☑ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

☑ I am an Authorized Agent signing on behalf of the Generator, and I have confirmed with the Generator that information contained in this profile, as well as supporting documents provided, are accurate and complete.

Name (Print): Jennifer Rogers Date: 03/12/2020

Title: Project Engineer

Company: GHD Services, Inc.

Certification Signature

Jennifer Rogers

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THINK GREEN.®

QUESTIONS? CALL 800 963 4776 FOR ASSISTANCE

EZ Profile™ Addendum

Only complete this Addendum if prompted by responses on EZ Profile™ (page 1) or to provide additional information. Sections and question numbers correspond to EZ Profile™.

Profile Number: 411160FL

C. MATERIAL INFORMATION

Describe Process Generating Material (Continued from page 1): If more space is needed, please attach additional pages.

and is scheduled for demolition.

Material Composition and Contaminants (Continued from page 1): If more space is needed, please attach additional pages.

5.	
6.	
7.	
8.	
9.	
Total composition must be equal to or greater than 100%	≥100%

D. REGULATORY INFORMATION

Only questions with a "Yes" response in Section D on the EZ Profile™ form (page 1) need to be answered here.

1. EPA Hazardous Waste
   a. Please list all USEPA listed and characteristic waste code numbers:
   b. Is the material subject to the Alternative Debris standards (40 CFR 268.45)? ❑ Yes ❑ No
   c. Is the material subject to the Alternative Soil standards (40 CFR 268.49)? → If Yes, complete question 4. ❑ Yes ❑ No
   d. Is the material exempt from Subpart CC Controls (40 CFR 264.1083)? ❑ Yes ❑ No
      → If Yes, please check **one** of the following:
      ❑ Waste meets LDR or treatment exemptions for organics (40 CFR 264.1082(c)(2) or (c)(4))
      ❑ Waste contains VOCs that average <500 ppmw (CFR 264.1082(c)(1)) – will require annual update.
2. State Hazardous Waste → Please list all state waste codes: _____
3. For material that is Treated, Delisted, or Excluded → Please indicate the category, below:
   ❑ Delisted Hazardous Waste ❑ Excluded Waste under 40 CFR 261.4 → Specify Exclusion: _____
   ❑ Treated Hazardous Waste Debris ❑ Treated Characteristic Hazardous Waste → If checked, complete question 4.
4. Underlying Hazardous Constituents → Please list all Underlying Hazardous Constituents:
5. Industries regulated under Benzene NESHAP include petroleum refineries, chemical manufacturing plants, coke by-product recovery plants, and TSDFs.
   a. Are you a TSDF? → If yes, please complete Benzene NESHAP questionnaire. If not, continue. ❑ Yes ❑ No
   b. Does this material contain benzene? ❑ Yes ❑ No
      1. If yes, what is the flow weighted average concentration? _____ ppmw
   c. What is your facility's current total annual benzene quantity in Megagrams? ❑ <1 Mg ❑ 1–9.99 Mg ❑ ≥10 Mg
   d. Is this waste soil from a remediation? ❑ Yes ❑ No
      1. If yes, what is the benzene concentration in remediation waste? _____ ppmw
   e. Does the waste contain >10% water/moisture? ❑ Yes ❑ No
   f. Has material been treated to remove 99% of the benzene or to achieve <10 ppmw? ❑ Yes ❑ No
   g. Is material exempt from controls in accordance with 40 CFR 61.342? ❑ Yes ❑ No
      → If yes, specify exemption: _____
   h. Based on your knowledge of your waste and the BWON regulations, do you believe that this waste stream is subject to treatment and control requirements at an off-site TSDF? ❑ Yes ❑ No
6. 40 CFR 63 GGGGG → Does the material contain <500 ppmw VOHAPs at the point of determination? ❑ Yes ❑ No
7. CERCLA or State-Mandated clean up → Please submit the Record of Decision or other documentation with process information to assist others in the evaluation for proper disposal. A "Determination of Acceptability" may be needed for CERCLA wastes not going to a CERCLA approved facility.
8. NRC or state regulated radioactive or NORM Waste → Please identify Isotopes and pCi/g: _____

Revised June 30, 2015

WASTE MANAGEMENT

EZ Profile™

Requested Facility: Lee Hendry ❑ Unsure Profile Number: 411161FL

❑ Multiple Generator Locations (Attach Locations) ❑ Request Certificate of Disposal ❑ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Lee County Utilities - Waterway Estates WTP
2. Site Address: 4276 St Clair Ave W
   (City, State, ZIP) North Fort Myers FL 33903
3. County: Lee
4. Contact Name: Henry Barroso
5. Email: HBarroso@leegov.com
6. Phone: (239) 567-2182 7. Fax: _____
8. Generator EPA ID: _____ ☑ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ☑ SAME AS GENERATOR

1. Billing Name: Lee County Utilities - Waterway Estates WTP
2. Billing Address: 4276 St Clair Ave W
   (City, State, ZIP) North Fort Myers FL 33903
3. Contact Name: Henry Barroso
4. Email: HBarroso@leegov.com
5. Phone: (239) 567-2182 6. Fax: _____
7. WM Hauled? ❑ Yes ❑ No
8. P.O. Number: _____
9. Payment Method: ❑ Credit Account ❑ Cash ❑ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Sediments/filter-material - WTP filter tanks
   Describe Process Generating Material: ❑ See Attached

Non-contaminated sediments/filter material (e.g. sands) remaining in process tanks (i.e. filter, ID D-1) at the Waterway Estates (WWE) muncipal water treatment plant (WTP) that has been out-of-service/decommissioned for several years and

2. Material Composition and Contaminants: ❑ See Attached

1. sediments/filter-material-WTP filter tanks	100 %
2.	
3.	
4.	
Total comp. must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ☑ N/A
4. Color: varies
5. Physical State at 70˚F: ☑ Solid ❑ Liquid ❑ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ❑ Yes ☑ No Describe: _____
9. Flash Point: ❑ <140˚F ❑ 140˚–199˚F ❑ ≥200˚ ☑ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ❑ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ❑ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ❑ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ❑ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ❑ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ❑ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ❑ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ❑ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ❑ Yes ☑ No
   a. Regulated by 40 CFR 761? ❑ Yes ❑ No
   b. Remediation under 40 CFR 761.61 (a)? ❑ Yes ❑ No
   c. Were PCB imported into the US? ❑ Yes ❑ No
10. Regulated and/or Untreated Medical/Infectious Waste? ❑ Yes ☑ No
11. Contains Asbestos? ❑ Yes ☑ No
    → If Yes: ❑ Non-Friable ❑ Non-Friable – Regulated ❑ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes
   Please identify applicable samples and/or lab reports:

Sample IDs are WWEWTP D-1 DEEP and WWEWTP D-1 TROUGH. Lab reports are AEL Report # F2000467 LCU PLANTS DEMO and Jupiter Report # 2066569.

2. Other information attached (such as MSDS)? ❑ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ❑ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 30
   ❑ Tons ☑ Yards ❑ Drums ❑ Gallons ❑ Other: _____
3. Container Type and Size: _____
4. USDOT Proper Shipping Name: ☑ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

☑ I am an Authorized Agent signing on behalf of the Generator, and I have confirmed with the Generator that information contained in this profile, as well as supporting documents provided, are accurate and complete.

Name (Print): Jennifer Rogers Date: 03/12/2020

Title: Project Engineer

Company: GHD Services, Inc.

Certification Signature

Jennifer Rogers

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QUESTIONS? CALL 800 963 4776 FOR ASSISTANCE

EZ Profile™ Addendum

Only complete this Addendum if prompted by responses on EZ Profile™ (page 1) or to provide additional information. Sections and question numbers correspond to EZ Profile™.

Profile Number: 411161FL

C. MATERIAL INFORMATION

Describe Process Generating Material (Continued from page 1): If more space is needed, please attach additional pages.

is scheduled for demolition.

Material Composition and Contaminants (Continued from page 1): If more space is needed, please attach additional pages.

5.	
6.	
7.	
8.	
9.	
Total composition must be equal to or greater than 100%	≥100%

D. REGULATORY INFORMATION

Only questions with a "Yes" response in Section D on the EZ Profile™ form (page 1) need to be answered here.

1. EPA Hazardous Waste
   a. Please list all USEPA listed and characteristic waste code numbers:
   b. Is the material subject to the Alternative Debris standards (40 CFR 268.45)? ❑ Yes ❑ No
   c. Is the material subject to the Alternative Soil standards (40 CFR 268.49)? → If Yes, complete question 4. ❑ Yes ❑ No
   d. Is the material exempt from Subpart CC Controls (40 CFR 264.1083)? ❑ Yes ❑ No
      → If Yes, please check **one** of the following:
      ❑ Waste meets LDR or treatment exemptions for organics (40 CFR 264.1082(c)(2) or (c)(4))
      ❑ Waste contains VOCs that average <500 ppmw (CFR 264.1082(c)(1)) – will require annual update.
2. State Hazardous Waste → Please list all state waste codes: _____
3. For material that is Treated, Delisted, or Excluded → Please indicate the category, below:
   ❑ Delisted Hazardous Waste ❑ Excluded Waste under 40 CFR 261.4 → Specify Exclusion: _____
   ❑ Treated Hazardous Waste Debris ❑ Treated Characteristic Hazardous Waste → If checked, complete question 4.
4. Underlying Hazardous Constituents → Please list all Underlying Hazardous Constituents:
5. Industries regulated under Benzene NESHAP include petroleum refineries, chemical manufacturing plants, coke by-product recovery plants, and TSDFs.
   a. Are you a TSDF? → If yes, please complete Benzene NESHAP questionnaire. If not, continue. ❑ Yes ❑ No
   b. Does this material contain benzene? ❑ Yes ❑ No
      1. If yes, what is the flow weighted average concentration? _____ ppmw
   c. What is your facility's current total annual benzene quantity in Megagrams? ❑ <1 Mg ❑ 1–9.99 Mg ❑ ≥10 Mg
   d. Is this waste soil from a remediation? ❑ Yes ❑ No
      1. If yes, what is the benzene concentration in remediation waste? _____ ppmw
   e. Does the waste contain >10% water/moisture? ❑ Yes ❑ No
   f. Has material been treated to remove 99% of the benzene or to achieve <10 ppmw? ❑ Yes ❑ No
   g. Is material exempt from controls in accordance with 40 CFR 61.342? ❑ Yes ❑ No
      → If yes, specify exemption: _____
   h. Based on your knowledge of your waste and the BWON regulations, do you believe that this waste stream is subject to treatment and control requirements at an off-site TSDF? ❑ Yes ❑ No
6. 40 CFR 63 GGGGG → Does the material contain <500 ppmw VOHAPs at the point of determination? ❑ Yes ❑ No
7. CERCLA or State-Mandated clean up → Please submit the Record of Decision or other documentation with process information to assist others in the evaluation for proper disposal. A "Determination of Acceptability" may be needed for CERCLA wastes not going to a CERCLA approved facility.
8. NRC or state regulated radioactive or NORM Waste → Please identify Isotopes and pCi/g: _____

WASTE MANAGEMENT

EZ Profile™

Requested Facility: Lee Hendry ❑ Unsure Profile Number: 411162FL

❑ Multiple Generator Locations (Attach Locations) ☑ Request Certificate of Disposal ❑ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Lee County Utilities - Waterway Estates WTP
2. Site Address: 4276 St Clair Ave W
   (City, State, ZIP) North Fort Myers FL 33903
3. County: Lee
4. Contact Name: Henry Barroso
5. Email: HBarroso@leegov.com
6. Phone: (239) 567-2182 7. Fax: _____
8. Generator EPA ID: _____ ☑ N/A
9. State ID: _____ ☑ N/A

B. BILLING INFORMATION ☑ SAME AS GENERATOR

1. Billing Name: Lee County Utilities - Waterway Estates WTP
2. Billing Address: 4276 St Clair Ave W
   (City, State, ZIP) North Fort Myers FL 33903
3. Contact Name: Henry Barroso
4. Email: HBarroso@leegov.com
5. Phone: (239) 567-2182 6. Fax: _____
7. WM Hauled? ❑ Yes ❑ No
8. P.O. Number: _____
9. Payment Method: ❑ Credit Account ❑ Cash ❑ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Lime-sludge-type material - WTP tanks D2 and D9
   Describe Process Generating Material: ❑ See Attached

Lime sludge type material remaining in process tanks (i.e. lime sludge holding tank and clearwell) at the Waterway Estates (WWE) muncipal water treatment plant (WTP) that has been out-of-service/decommissioned for several years and is

2. Material Composition and Contaminants: ❑ See Attached

1. lime-sludge-type materials - WTP tanks	100 %
2.	
3.	
4.	
Total comp. must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ☑ N/A
4. Color: light grey-green
5. Physical State at 70˚F: ❑ Solid ❑ Liquid ☑ Other: limesludge
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ❑ Yes ☑ No Describe: _____
9. Flash Point: ❑ <140˚F ❑ 140˚–199˚F ❑ ≥200˚ ☑ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ❑ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ❑ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ❑ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ❑ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ❑ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ❑ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ❑ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ❑ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ❑ Yes ☑ No
   a. Regulated by 40 CFR 761? ❑ Yes ❑ No
   b. Remediation under 40 CFR 761.61 (a)? ❑ Yes ❑ No
   c. Were PCB imported into the US? ❑ Yes ❑ No
10. Regulated and/or Untreated Medical/Infectious Waste? ❑ Yes ☑ No
11. Contains Asbestos? ❑ Yes ☑ No
    → If Yes: ❑ Non-Friable ❑ Non-Friable – Regulated ❑ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes
   Please identify applicable samples and/or lab reports:

Sample IDs are WWEWTP D-2 and WWEWTP D-9. Lab reports are AEL Report # F2000467 LCU PLANTS DEMO and Jupiter Report # 2066569.

2. Other information attached (such as MSDS)? ❑ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ❑ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 60
   ❑ Tons ☑ Yards ❑ Drums ❑ Gallons ❑ Other: _____
3. Container Type and Size: _____
4. USDOT Proper Shipping Name: ☑ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

☑ I am an Authorized Agent signing on behalf of the Generator, and I have confirmed with the Generator that information contained in this profile, as well as supporting documents provided, are accurate and complete.

Name (Print): Jennifer Rogers Date: 03/12/2020

Title: Project Engineer

Company: GHD Services, Inc.

Certification Signature

Jennifer Rogers

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THINK GREEN.®

QUESTIONS? CALL 800 963 4776 FOR ASSISTANCE

EZ Profile™ Addendum

Only complete this Addendum if prompted by responses on EZ Profile™ (page 1) or to provide additional information. Sections and question numbers correspond to EZ Profile™.

Profile Number: 411162FL

C. MATERIAL INFORMATION

Describe Process Generating Material (Continued from page 1): If more space is needed, please attach additional pages.

scheduled for demolition.

Material Composition and Contaminants (Continued from page 1): If more space is needed, please attach additional pages.

5.	
6.	
7.	
8.	
9.	
Total composition must be equal to or greater than 100%	≥100%

D. REGULATORY INFORMATION

Only questions with a "Yes" response in Section D on the EZ Profile™ form (page 1) need to be answered here.

1. EPA Hazardous Waste
   a. Please list all USEPA listed and characteristic waste code numbers:
   b. Is the material subject to the Alternative Debris standards (40 CFR 268.45)? ❑ Yes ❑ No
   c. Is the material subject to the Alternative Soil standards (40 CFR 268.49)? → If Yes, complete question 4. ❑ Yes ❑ No
   d. Is the material exempt from Subpart CC Controls (40 CFR 264.1083)? ❑ Yes ❑ No
      → If Yes, please check **one** of the following:
      ❑ Waste meets LDR or treatment exemptions for organics (40 CFR 264.1082(c)(2) or (c)(4))
      ❑ Waste contains VOCs that average <500 ppmw (CFR 264.1082(c)(1)) – will require annual update.
2. State Hazardous Waste → Please list all state waste codes: _____
3. For material that is Treated, Delisted, or Excluded → Please indicate the category, below:
   ❑ Delisted Hazardous Waste ❑ Excluded Waste under 40 CFR 261.4 → Specify Exclusion: _____
   ❑ Treated Hazardous Waste Debris ❑ Treated Characteristic Hazardous Waste → If checked, complete question 4.
4. Underlying Hazardous Constituents → Please list all Underlying Hazardous Constituents:
5. Industries regulated under Benzene NESHAP include petroleum refineries, chemical manufacturing plants, coke by-product recovery plants, and TSDFs.
   a. Are you a TSDF? → If yes, please complete Benzene NESHAP questionnaire. If not, continue. ❑ Yes ❑ No
   b. Does this material contain benzene? ❑ Yes ❑ No
      1. If yes, what is the flow weighted average concentration? _____ ppmw
   c. What is your facility's current total annual benzene quantity in Megagrams? ❑ <1 Mg ❑ 1–9.99 Mg ❑ ≥10 Mg
   d. Is this waste soil from a remediation? ❑ Yes ❑ No
      1. If yes, what is the benzene concentration in remediation waste? _____ ppmw
   e. Does the waste contain >10% water/moisture? ❑ Yes ❑ No
   f. Has material been treated to remove 99% of the benzene or to achieve <10 ppmw? ❑ Yes ❑ No
   g. Is material exempt from controls in accordance with 40 CFR 61.342? ❑ Yes ❑ No
      → If yes, specify exemption: _____
   h. Based on your knowledge of your waste and the BWON regulations, do you believe that this waste stream is subject to treatment and control requirements at an off-site TSDF? ❑ Yes ❑ No
6. 40 CFR 63 GGGGG → Does the material contain <500 ppmw VOHAPs at the point of determination? ❑ Yes ❑ No
7. CERCLA or State-Mandated clean up → Please submit the Record of Decision or other documentation with process information to assist others in the evaluation for proper disposal. A "Determination of Acceptability" may be needed for CERCLA wastes not going to a CERCLA approved facility.
8. NRC or state regulated radioactive or NORM Waste → Please identify Isotopes and pCi/g: _____

Revised June 30, 2015

EZ Profile™

Requested Facility: Okeechobee Landfill ❑ Unsure Profile Number: _____

❑ Multiple Generator Locations (Attach Locations) ☑ Request Certificate of Disposal ❑ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Lee County Utilities - Fort Myers Beach WWTP
2. Site Address: 17155 Pine Ridge Rd
   (City, State, ZIP) Fort Myers Beach, FL 33931
3. County: Lee County
4. Contact Name: _____
5. Email: _____
6. Phone: _____ 7. Fax: _____
8. Generator EPA ID: _____ ❑ N/A
9. State ID: _____ ❑ N/A

B. BILLING INFORMATION ❑ SAME AS GENERATOR

1. Billing Name: To be determined (bid contractor to Lee County)
2. Billing Address: _____
   (City, State, ZIP) _____
3. Contact Name: _____
4. Email: _____
5. Phone: _____ 6. Fax: _____
7. WM Hauled? ❑ Yes ☑ No
8. P.O. Number: _____
9. Payment Method: ❑ Credit Account ❑ Cash ❑ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Material from process tanks at decommissioned WWTP.
   Describe Process Generating Material: ❑ See Attached

   Non-contaminated filter materials (e.g. sands/anthracite/gravels) remaining in process tank (i.e. filters) at the Fort Myers Beach (FMB) municipal wastewater treatment plant (WWTP) that have been out-of-service/decommissioned for several years and is scheduled for demolition.

2. Material Composition and Contaminants: ❑ See Attached

1. Filter material from WWTP filter tanks (ID D-2 through D-6)	100 %
2.	
3.	
4.	
Total comp. must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ❑ N/A
4. Color: Black/brown
5. Physical State at 70˚F: ☑ Solid ❑ Liquid ❑ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ❑ Yes ☑ No Describe: _____
9. Flash Point: ❑ <140˚F ❑ 140˚–199˚F ❑ ≥200˚ ☑ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ❑ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ❑ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ❑ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ❑ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ❑ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ❑ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ❑ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ❑ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ❑ Yes ☑ No
   a. Regulated by 40 CFR 761? ❑ Yes ❑ No
   b. Remediation under 40 CFR 761.61 (a)? ❑ Yes ❑ No
   c. Were PCB imported into the US? ❑ Yes ❑ No
10. Regulated and/or Untreated Medical/Infectious Waste? ❑ Yes ☑ No
11. Contains Asbestos? ❑ Yes ☑ No
    → If Yes: ❑ Non-Friable ❑ Non-Friable – Regulated ❑ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes
   Please identify applicable samples and/or lab reports:

   Sample IDs are FMBWWTP-D-2L and FMBWWTP-D-2U through FMBWWTP-D-6L and FMBWWTP-D-6U. Lab reports are AEL Report # F2000467 LCU PLANTS DEMO and Jupiter Report # 2066570.

2. Other information attached (such as MSDS)? ❑ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ❑ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: approx 700 cubic yards
   ❑ Tons ☑ Yards ❑ Drums ❑ Gallons ❑ Other: _____
3. Container Type and Size: To be determined.
4. USDOT Proper Shipping Name: ☑ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): Jennifer L. Rogers Date: 3/6/2020

Title: Project Engineer

Company: GHD Services, Inc.

Certification Signature

Advanced Environmental Laboratories, Inc.

Advanced Environmental Laboratories, Inc
13100 Westlinks Terrace, Unit 10 Ft. Myers FL 33913
Payments: P.O. Box 551580Jacksonville, FL 32255-1580
Phone: (239) 674-8130
Fax: (239) 674-8128

February 11, 2020

Jennifer L. Rogers
GHD
2675 Winkler Ave, Suite 180
Fort Myers, FL 33901

RE: Workorder: F2000467 LCU PLANTS DEMO

Dear Jennifer Rogers:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, January 29, 2020. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

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

Sincerely,

Josh Snead - Laboratory Manager
JSnead@aellab.com

Enclosures

CERTIFICATE OF ANALYSIS

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SAMPLE SUMMARY

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Matrix	Date Collected	Date Received
F2000467001	FMBWWTP D6U	Soil	1/27/2020 09:40	1/29/2020 13:10
F2000467002	FMBWWTP D6L	Soil	1/27/2020 09:50	1/29/2020 13:10
F2000467003	FMBWWTP D5U	Soil	1/27/2020 10:20	1/29/2020 13:10
F2000467004	FMBWWTP D5L	Soil	1/27/2020 10:30	1/29/2020 13:10
F2000467005	FMBWWTP D4U	Soil	1/27/2020 11:20	1/29/2020 13:10
F2000467006	FMBWWTP D4L	Soil	1/27/2020 11:30	1/29/2020 13:10
F2000467007	FMBWWTP D3U	Soil	1/27/2020 12:15	1/29/2020 13:10
F2000467008	FMBWWTP D3L	Soil	1/27/2020 12:25	1/29/2020 13:10
F2000467009	FMBWWTP D2U	Soil	1/27/2020 13:15	1/29/2020 13:10
F2000467010	FMBWWTP D2L	Soil	1/27/2020 13:25	1/29/2020 13:10
F2000467011	FMBWWTP D9	Soil	1/27/2020 14:00	1/29/2020 13:10
F2000467012	SCWWTP-D-4	Soil	1/28/2020 10:30	1/29/2020 13:10
F2000467013	SCWWTP-D-2/2.5FT	Soil	1/28/2020 12:15	1/29/2020 13:10
F2000467014	SCWWTP-D-3 / 2.5FT	Soil	1/28/2020 12:40	1/29/2020 13:10
F2000467015	WWEWTP D-9	Soil	1/28/2020 15:10	1/29/2020 13:10
F2000467016	WWEWTP D-1 DEEP	Soil	1/28/2020 16:00	1/29/2020 13:10
F2000467017	WWEWTP D-1 TROUGH	Soil	1/28/2020 15:45	1/29/2020 13:10
F2000467018	WWEWTP D-2	Soil	1/29/2020 08:50	1/29/2020 13:10

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467001** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D6U** Date Collected: 01/27/20 09:40

Results for sample F2000467001 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/4/2020 20:26	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/4/2020 20:26	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/4/2020 20:26	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/4/2020 20:26	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/4/2020 20:26	T
Lead	**0.078**	**U,J4**	**mg/L**	**1**	0.10	0.078	2/4/2020 20:26	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/4/2020 20:26	T
Silver	**0.034**	**U,J4**	**mg/L**	**1**	0.050	0.034	2/4/2020 20:26	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/4/2020 14:59	T
VOLATILES, TCLP								
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 18:15	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 18:15	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:15	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 18:15	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 18:15	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 18:15	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 18:15	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 18:15	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 18:15	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 18:15	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 18:15	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 18:15	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 18:15	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:15	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 18:15	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 18:15	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 18:15	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 18:15	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 18:15	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467001** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D6U** Date Collected: 01/27/20 09:40

Results for sample F2000467001 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 18:15	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 18:15	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 18:15	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 18:15	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 18:15	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 18:15	T
4-Methyl-2-pentanone (MIBK)	**12**		**ug/L**	**10**	10	9.3	2/5/2020 18:15	T
Acetone	**90**		**ug/L**	**10**	20	10	2/5/2020 18:15	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 18:15	T
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 18:15	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:15	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 18:15	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 18:15	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:15	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 18:15	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 18:15	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 18:15	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:15	T
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 18:15	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 18:15	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 18:15	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 18:15	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 18:15	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 18:15	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 18:15	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 18:15	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 18:15	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 18:15	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 18:15	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 18:15	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U,J4**	**ug/L**	**10**	10	4.1	2/5/2020 18:15	T
Methylene Chloride	**10**	**U,V**	**ug/L**	**10**	10	10	2/5/2020 18:15	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 18:15	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 18:15	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:15	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 18:15	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:15	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 18:15	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 18:15	T
Vinyl Chloride	**2.0**	**U,J4**	**ug/L**	**10**	10	2.0	2/5/2020 18:15	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467001** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D6U** Date Collected: 01/27/20 09:40

Results for sample F2000467001 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 18:15	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 18:15	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:15	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 18:15	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 18:15	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 18:15	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 18:15	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 18:15	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:15	T
1,2-Dichloroethane-d4 (S)	**113**		**%**	**10**	69-134		2/5/2020 18:15	
Toluene-d8 (S)	**104**		**%**	**10**	72-122		2/5/2020 18:15	
Bromofluorobenzene (S)	**110**		**%**	**10**	79-126		2/5/2020 18:15	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**140**		**mg/Kg**	**2.5**	35	4.6	1/30/2020 12:35	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**31**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467002** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D6L** Date Collected: 01/27/20 09:50

Results for sample F2000467002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/4/2020 20:53	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/4/2020 20:53	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/4/2020 20:53	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/4/2020 20:53	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/4/2020 20:53	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467002** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D6L** Date Collected: 01/27/20 09:50

Results for sample F2000467002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/4/2020 20:53	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/4/2020 20:53	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/4/2020 20:53	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/4/2020 15:13	T
VOLATILES, TCLP								
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 18:41	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 18:41	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:41	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 18:41	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 18:41	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 18:41	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 18:41	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 18:41	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 18:41	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 18:41	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 18:41	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 18:41	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 18:41	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:41	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 18:41	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 18:41	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 18:41	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 18:41	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 18:41	T
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 18:41	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 18:41	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 18:41	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 18:41	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 18:41	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 18:41	T
4-Methyl-2-pentanone (MIBK)	**12**		**ug/L**	**10**	10	9.3	2/5/2020 18:41	T
Acetone	**76**		**ug/L**	**10**	20	10	2/5/2020 18:41	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 18:41	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467002** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D6L** Date Collected: 01/27/20 09:50

Results for sample F2000467002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 18:41	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:41	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 18:41	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 18:41	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:41	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 18:41	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 18:41	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 18:41	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:41	T
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 18:41	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 18:41	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 18:41	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 18:41	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 18:41	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 18:41	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 18:41	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 18:41	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 18:41	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 18:41	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 18:41	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 18:41	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 18:41	T
Methylene Chloride	**14**	**V**	**ug/L**	**10**	10	10	2/5/2020 18:41	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 18:41	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 18:41	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:41	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 18:41	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 18:41	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 18:41	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 18:41	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:41	T
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 18:41	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 18:41	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:41	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 18:41	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 18:41	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 18:41	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 18:41	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 18:41	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 18:41	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467002** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D6L** Date Collected: 01/27/20 09:50

Results for sample F2000467002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
1,2-Dichloroethane-d4 (S)	**116**		**%**	**10**	69-134		2/5/2020 18:41	
Toluene-d8 (S)	**104**		**%**	**10**	72-122		2/5/2020 18:41	
Bromofluorobenzene (S)	**108**		**%**	**10**	79-126		2/5/2020 18:41	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**210**		**mg/Kg**	**2.5**	31	4.0	1/30/2020 12:59	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**26**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467003** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D5U** Date Collected: 01/27/20 10:20

Results for sample F2000467003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/4/2020 20:56	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/4/2020 20:56	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/4/2020 20:56	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/4/2020 20:56	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/4/2020 20:56	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/4/2020 20:56	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/4/2020 20:56	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/4/2020 20:56	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/4/2020 15:16	T
VOLATILES, TCLP								

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467003** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D5U** Date Collected: 01/27/20 10:20

Results for sample F2000467003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 19:07	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 19:07	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:07	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 19:07	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 19:07	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 19:07	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 19:07	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 19:07	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 19:07	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 19:07	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 19:07	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 19:07	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 19:07	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:07	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 19:07	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 19:07	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 19:07	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 19:07	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 19:07	T
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 19:07	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 19:07	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 19:07	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 19:07	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 19:07	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 19:07	T
4-Methyl-2-pentanone (MIBK)	**9.4**	**I**	**ug/L**	**10**	10	9.3	2/5/2020 19:07	T
Acetone	**81**		**ug/L**	**10**	20	10	2/5/2020 19:07	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 19:07	T
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 19:07	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:07	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 19:07	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 19:07	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:07	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 19:07	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 19:07	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 19:07	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:07	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467003** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D5U** Date Collected: 01/27/20 10:20

Results for sample F2000467003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 19:07	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 19:07	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 19:07	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 19:07	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 19:07	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 19:07	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 19:07	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 19:07	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 19:07	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 19:07	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 19:07	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 19:07	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 19:07	T
Methylene Chloride	**28**	**V**	**ug/L**	**10**	10	10	2/5/2020 19:07	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 19:07	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 19:07	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:07	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 19:07	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:07	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 19:07	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 19:07	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:07	T
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 19:07	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 19:07	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:07	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 19:07	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 19:07	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 19:07	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 19:07	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 19:07	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:07	T
1,2-Dichloroethane-d4 (S)	**119**		**%**	**10**	69-134		2/5/2020 19:07	
Toluene-d8 (S)	**103**		**%**	**10**	72-122		2/5/2020 19:07	
Bromofluorobenzene (S)	**108**		**%**	**10**	79-126		2/5/2020 19:07	

WET CHEMISTRY

Analysis Desc: 9056, Soil Analytical Method: EPA 9056

Sulfate	**600**		**mg/Kg**	**1**	14	1.9	1/30/2020 13:12	F

WET CHEMISTRY

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467003** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D5U** Date Collected: 01/27/20 10:20

Results for sample F2000467003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**36**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467004** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D5L** Date Collected: 01/27/20 10:30

Results for sample F2000467004 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/4/2020 21:00	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/4/2020 21:00	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/4/2020 21:00	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/4/2020 21:00	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/4/2020 21:00	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/4/2020 21:00	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/4/2020 21:00	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/4/2020 21:00	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/4/2020 15:19	T
VOLATILES, TCLP								
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 19:34	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 19:34	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:34	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 19:34	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 19:34	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 19:34	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 19:34	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467004** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D5L** Date Collected: 01/27/20 10:30

Results for sample F2000467004 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 19:34	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 19:34	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 19:34	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 19:34	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 19:34	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 19:34	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:34	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 19:34	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 19:34	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 19:34	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 19:34	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 19:34	T
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 19:34	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 19:34	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 19:34	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 19:34	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 19:34	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 19:34	T
4-Methyl-2-pentanone (MIBK)	**9.3**	**U**	**ug/L**	**10**	10	9.3	2/5/2020 19:34	T
Acetone	**58**		**ug/L**	**10**	20	10	2/5/2020 19:34	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 19:34	T
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 19:34	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:34	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 19:34	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 19:34	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:34	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 19:34	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 19:34	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 19:34	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:34	T
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 19:34	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 19:34	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 19:34	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 19:34	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 19:34	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 19:34	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 19:34	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 19:34	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 19:34	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 19:34	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467004** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D5L** Date Collected: 01/27/20 10:30

Results for sample F2000467004 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 19:34	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 19:34	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 19:34	T
Methylene Chloride	**16**	**V**	**ug/L**	**10**	10	10	2/5/2020 19:34	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 19:34	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 19:34	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:34	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 19:34	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 19:34	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 19:34	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 19:34	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:34	T
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 19:34	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 19:34	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:34	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 19:34	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 19:34	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 19:34	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 19:34	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 19:34	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 19:34	T
1,2-Dichloroethane-d4 (S)	**123**		**%**	**10**	69-134		2/5/2020 19:34	
Toluene-d8 (S)	**102**		**%**	**10**	72-122		2/5/2020 19:34	
Bromofluorobenzene (S)	**101**		**%**	**10**	79-126		2/5/2020 19:34	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**250**		**mg/Kg**	**1**	13	1.7	1/30/2020 13:24	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**33**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467005** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D4U** Date Collected: 01/27/20 11:20

Results for sample F2000467005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/4/2020 21:04	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/4/2020 21:04	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/4/2020 21:04	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/4/2020 21:04	T
Copper	**0.020**	**I**	**mg/L**	**1**	0.080	0.014	2/4/2020 21:04	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/4/2020 21:04	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/4/2020 21:04	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/4/2020 21:04	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/4/2020 15:21	T
VOLATILES, TCLP								
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 20:00	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 20:00	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:00	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 20:00	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 20:00	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 20:00	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 20:00	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 20:00	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 20:00	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:00	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 20:00	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 20:00	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 20:00	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:00	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 20:00	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 20:00	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 20:00	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:00	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 20:00	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467005** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D4U** Date Collected: 01/27/20 11:20

Results for sample F2000467005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 20:00	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 20:00	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 20:00	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 20:00	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 20:00	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 20:00	T
4-Methyl-2-pentanone (MIBK)	**9.8**	**I**	**ug/L**	**10**	10	9.3	2/5/2020 20:00	T
Acetone	**62**		**ug/L**	**10**	20	10	2/5/2020 20:00	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 20:00	T
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 20:00	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:00	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 20:00	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 20:00	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:00	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 20:00	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 20:00	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 20:00	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:00	T
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 20:00	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 20:00	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 20:00	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 20:00	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:00	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 20:00	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 20:00	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 20:00	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 20:00	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:00	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 20:00	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 20:00	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 20:00	T
Methylene Chloride	**18**	**V**	**ug/L**	**10**	10	10	2/5/2020 20:00	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 20:00	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:00	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:00	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 20:00	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:00	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:00	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:00	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:00	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467005** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D4U** Date Collected: 01/27/20 11:20

Results for sample F2000467005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 20:00	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 20:00	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:00	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 20:00	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 20:00	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 20:00	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 20:00	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 20:00	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:00	T
1,2-Dichloroethane-d4 (S)	**126**		**%**	**10**	69-134		2/5/2020 20:00	
Toluene-d8 (S)	**105**		**%**	**10**	72-122		2/5/2020 20:00	
Bromofluorobenzene (S)	**109**		**%**	**10**	79-126		2/5/2020 20:00	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**410**		**mg/Kg**	**1**	15	2.0	1/30/2020 14:05	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**37**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467006** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D4L** Date Collected: 01/27/20 11:30

Results for sample F2000467006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/4/2020 21:08	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/4/2020 21:08	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/4/2020 21:08	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/4/2020 21:08	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/4/2020 21:08	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467006** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D4L** Date Collected: 01/27/20 11:30

Results for sample F2000467006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/4/2020 21:08	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/4/2020 21:08	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/4/2020 21:08	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/4/2020 15:24	T
VOLATILES, TCLP								
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 20:26	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 20:26	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:26	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 20:26	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 20:26	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 20:26	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 20:26	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 20:26	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 20:26	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:26	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 20:26	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 20:26	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 20:26	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:26	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 20:26	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 20:26	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 20:26	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:26	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 20:26	T
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 20:26	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 20:26	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 20:26	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 20:26	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 20:26	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 20:26	T
4-Methyl-2-pentanone (MIBK)	**11**		**ug/L**	**10**	10	9.3	2/5/2020 20:26	T
Acetone	**82**		**ug/L**	**10**	20	10	2/5/2020 20:26	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 20:26	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467006** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D4L** Date Collected: 01/27/20 11:30

Results for sample F2000467006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 20:26	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:26	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 20:26	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 20:26	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:26	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 20:26	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 20:26	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 20:26	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:26	T
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 20:26	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 20:26	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 20:26	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 20:26	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:26	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 20:26	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 20:26	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 20:26	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 20:26	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:26	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 20:26	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 20:26	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 20:26	T
Methylene Chloride	**13**	**V**	**ug/L**	**10**	10	10	2/5/2020 20:26	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 20:26	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:26	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:26	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 20:26	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:26	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:26	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:26	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:26	T
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 20:26	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 20:26	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:26	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 20:26	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 20:26	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 20:26	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 20:26	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 20:26	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:26	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467006** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D4L** Date Collected: 01/27/20 11:30

Results for sample F2000467006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
1,2-Dichloroethane-d4 (S)	**127**		**%**	**10**	69-134		2/5/2020 20:26	
Toluene-d8 (S)	**103**		**%**	**10**	72-122		2/5/2020 20:26	
Bromofluorobenzene (S)	**105**		**%**	**10**	79-126		2/5/2020 20:26	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**68**		**mg/Kg**	**1**	10	1.3	1/30/2020 14:20	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**5.2**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467007** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D3U** Date Collected: 01/27/20 12:15

Results for sample F2000467007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/3/2020 21:52	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/3/2020 21:52	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/3/2020 21:52	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/3/2020 21:52	T
Copper	**0.020**	**I**	**mg/L**	**1**	0.080	0.014	2/3/2020 21:52	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/3/2020 21:52	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/3/2020 21:52	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/3/2020 21:52	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00052**		**mg/L**	**1**	0.00050	0.00025	2/3/2020 14:58	T
VOLATILES, TCLP								

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467007** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D3U** Date Collected: 01/27/20 12:15

Results for sample F2000467007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 20:52	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 20:52	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:52	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 20:52	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 20:52	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 20:52	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 20:52	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 20:52	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 20:52	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:52	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 20:52	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 20:52	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 20:52	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:52	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 20:52	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 20:52	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 20:52	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:52	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 20:52	T
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 20:52	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 20:52	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 20:52	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 20:52	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 20:52	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 20:52	T
4-Methyl-2-pentanone (MIBK)	**14**		**ug/L**	**10**	10	9.3	2/5/2020 20:52	T
Acetone	**86**		**ug/L**	**10**	20	10	2/5/2020 20:52	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 20:52	T
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 20:52	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:52	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 20:52	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 20:52	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:52	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 20:52	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 20:52	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 20:52	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:52	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467007** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D3U** Date Collected: 01/27/20 12:15

Results for sample F2000467007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 20:52	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 20:52	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 20:52	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 20:52	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:52	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 20:52	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 20:52	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 20:52	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 20:52	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:52	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 20:52	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 20:52	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 20:52	T
Methylene Chloride	**13**	**V**	**ug/L**	**10**	10	10	2/5/2020 20:52	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 20:52	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:52	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:52	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 20:52	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 20:52	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 20:52	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 20:52	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:52	T
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 20:52	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 20:52	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:52	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 20:52	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 20:52	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 20:52	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 20:52	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 20:52	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 20:52	T
1,2-Dichloroethane-d4 (S)	**121**		**%**	**10**	69-134		2/5/2020 20:52	
Toluene-d8 (S)	**106**		**%**	**10**	72-122		2/5/2020 20:52	
Bromofluorobenzene (S)	**108**		**%**	**10**	79-126		2/5/2020 20:52	

WET CHEMISTRY

Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**140**		**mg/Kg**	**1**	11	1.5	1/30/2020 14:32	F

WET CHEMISTRY

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467007** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D3U** Date Collected: 01/27/20 12:15

Results for sample F2000467007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**16**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467008** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D3L** Date Collected: 01/27/20 12:25

Results for sample F2000467008 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/3/2020 22:03	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/3/2020 22:03	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/3/2020 22:03	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/3/2020 22:03	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/3/2020 22:03	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/3/2020 22:03	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/3/2020 22:03	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/3/2020 22:03	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/3/2020 15:09	T
VOLATILES, TCLP								
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 21:18	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 21:18	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:18	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 21:18	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 21:18	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 21:18	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 21:18	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467008** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D3L** Date Collected: 01/27/20 12:25

Results for sample F2000467008 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 21:18	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 21:18	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 21:18	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 21:18	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 21:18	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 21:18	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:18	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 21:18	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 21:18	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 21:18	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 21:18	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 21:18	T
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 21:18	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 21:18	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 21:18	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 21:18	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 21:18	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 21:18	T
4-Methyl-2-pentanone (MIBK)	**13**		**ug/L**	**10**	10	9.3	2/5/2020 21:18	T
Acetone	**120**		**ug/L**	**10**	20	10	2/5/2020 21:18	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 21:18	T
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 21:18	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:18	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 21:18	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 21:18	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:18	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 21:18	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 21:18	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 21:18	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:18	T
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 21:18	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 21:18	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 21:18	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 21:18	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 21:18	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 21:18	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 21:18	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 21:18	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 21:18	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 21:18	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467008** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D3L** Date Collected: 01/27/20 12:25

Results for sample F2000467008 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 21:18	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 21:18	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 21:18	T
Methylene Chloride	**10**	**U,V**	**ug/L**	**10**	10	10	2/5/2020 21:18	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 21:18	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 21:18	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:18	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 21:18	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:18	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 21:18	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 21:18	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:18	T
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 21:18	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 21:18	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:18	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 21:18	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 21:18	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 21:18	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 21:18	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 21:18	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:18	T
1,2-Dichloroethane-d4 (S)	**124**		**%**	**10**	69-134		2/5/2020 21:18	
Toluene-d8 (S)	**105**		**%**	**10**	72-122		2/5/2020 21:18	
Bromofluorobenzene (S)	**104**		**%**	**10**	79-126		2/5/2020 21:18	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**160**		**mg/Kg**	**1**	9.6	1.2	1/30/2020 14:44	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**4.5**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467009** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D2U** Date Collected: 01/27/20 13:15

Results for sample F2000467009 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/3/2020 22:08	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/3/2020 22:08	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/3/2020 22:08	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/3/2020 22:08	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/3/2020 22:08	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/3/2020 22:08	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/3/2020 22:08	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/3/2020 22:08	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/3/2020 15:12	T
VOLATILES, TCLP								
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 21:44	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 21:44	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:44	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 21:44	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 21:44	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 21:44	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 21:44	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 21:44	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 21:44	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 21:44	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 21:44	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 21:44	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 21:44	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:44	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 21:44	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 21:44	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 21:44	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 21:44	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 21:44	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467009** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D2U** Date Collected: 01/27/20 13:15

Results for sample F2000467009 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 21:44	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 21:44	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 21:44	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 21:44	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 21:44	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 21:44	T
4-Methyl-2-pentanone (MIBK)	**9.3**	**U**	**ug/L**	**10**	10	9.3	2/5/2020 21:44	T
Acetone	**43**		**ug/L**	**10**	20	10	2/5/2020 21:44	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 21:44	T
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 21:44	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:44	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 21:44	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 21:44	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:44	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 21:44	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 21:44	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 21:44	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:44	T
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 21:44	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 21:44	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 21:44	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 21:44	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 21:44	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 21:44	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 21:44	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 21:44	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 21:44	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 21:44	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 21:44	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 21:44	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 21:44	T
Methylene Chloride	**120**	**V**	**ug/L**	**10**	10	10	2/5/2020 21:44	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 21:44	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 21:44	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:44	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 21:44	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 21:44	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 21:44	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 21:44	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:44	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467009** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D2U** Date Collected: 01/27/20 13:15

Results for sample F2000467009 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 21:44	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 21:44	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:44	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 21:44	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 21:44	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 21:44	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 21:44	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 21:44	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 21:44	T
1,2-Dichloroethane-d4 (S)	**125**		**%**	**10**	69-134		2/5/2020 21:44	
Toluene-d8 (S)	**106**		**%**	**10**	72-122		2/5/2020 21:44	
Bromofluorobenzene (S)	**104**		**%**	**10**	79-126		2/5/2020 21:44	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**180**		**mg/Kg**	**1**	11	1.4	1/30/2020 14:57	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**17**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467010** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D2L** Date Collected: 01/27/20 13:25

Results for sample F2000467010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/3/2020 22:13	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/3/2020 22:13	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/3/2020 22:13	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/3/2020 22:13	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/3/2020 22:13	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467010** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D2L** Date Collected: 01/27/20 13:25

Results for sample F2000467010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/3/2020 22:13	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/3/2020 22:13	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/3/2020 22:13	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/3/2020 15:14	T
VOLATILES, TCLP								
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 22:10	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 22:10	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:10	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 22:10	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 22:10	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 22:10	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 22:10	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 22:10	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 22:10	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 22:10	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 22:10	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 22:10	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 22:10	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:10	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 22:10	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 22:10	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 22:10	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 22:10	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 22:10	T
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 22:10	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 22:10	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 22:10	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 22:10	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 22:10	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 22:10	T
4-Methyl-2-pentanone (MIBK)	**9.3**	**U**	**ug/L**	**10**	10	9.3	2/5/2020 22:10	T
Acetone	**37**		**ug/L**	**10**	20	10	2/5/2020 22:10	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 22:10	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467010** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D2L** Date Collected: 01/27/20 13:25

Results for sample F2000467010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 22:10	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:10	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 22:10	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 22:10	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:10	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 22:10	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 22:10	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 22:10	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:10	T
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 22:10	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 22:10	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 22:10	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 22:10	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 22:10	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 22:10	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 22:10	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 22:10	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 22:10	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 22:10	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 22:10	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 22:10	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 22:10	T
Methylene Chloride	**58**	**V**	**ug/L**	**10**	10	10	2/5/2020 22:10	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 22:10	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 22:10	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:10	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 22:10	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:10	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 22:10	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 22:10	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:10	T
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 22:10	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 22:10	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:10	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 22:10	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 22:10	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 22:10	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 22:10	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 22:10	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:10	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467010** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D2L** Date Collected: 01/27/20 13:25

Results for sample F2000467010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
1,2-Dichloroethane-d4 (S)	**124**		**%**	**10**	69-134		2/5/2020 22:10	
Toluene-d8 (S)	**108**		**%**	**10**	72-122		2/5/2020 22:10	
Bromofluorobenzene (S)	**116**		**%**	**10**	79-126		2/5/2020 22:10	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**91**		**mg/Kg**	**1**	11	1.4	1/30/2020 15:09	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**12**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467011** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D9** Date Collected: 01/27/20 14:00

Results for sample F2000467011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/3/2020 22:18	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/3/2020 22:18	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/3/2020 22:18	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/3/2020 22:18	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/3/2020 22:18	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/3/2020 22:18	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/3/2020 22:18	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/3/2020 22:18	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/3/2020 15:17	T
VOLATILES, TCLP								

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ANALYTICAL RESULTS QUALIFIERS

Workorder: F2000467 LCU PLANTS DEMO

PARAMETER QUALIFIERS

U	The compound was analyzed for but not detected.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
V	Method Blank Contamination
J4	Estimated Result

LAB QUALIFIERS

F	DOH Certification #E84492(AEL-F)(FL NELAC Certification)
T	DOH Certification #E84589(AEL-T)(FL NELAC Certification)

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: WCAf/1070 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006, F2000467007,

METHOD BLANK: 3366452

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Sulfate	mg/Kg	1.3	1.3	U

LABORATORY CONTROL SAMPLE: 3366453

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
WET CHEMISTRY						
Sulfate	mg/Kg	49	48	99	90-110	

QC Batch: WCAf/1071 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: F2000467011, F2000467012, F2000467013, F2000467014, F2000467015, F2000467016, F2000467017, F2000467018

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3366456 3366457 Original: F2000467011

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
WET CHEMISTRY											
Sulfate	mg/Kg	930	470	1500	1500	102	102	90-110	0	10	

QC Batch: DGMt/1143 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 01/31/2020 10:00
Associated Lab Samples: F2000467015, F2000467018

METHOD BLANK: 3368232

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3368232

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

LABORATORY CONTROL SAMPLE: 3368233

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.8	95	80-120	
Arsenic	mg/L	4	3.8	94	80-120	
Barium	mg/L	4	3.9	96	80-120	
Cadmium	mg/L	4	3.7	92	80-120	
Chromium	mg/L	4	3.8	96	80-120	
Copper	mg/L	4	4.0	100	80-120	
Lead	mg/L	4	3.5	88	80-120	
Selenium	mg/L	4	3.6	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368234 3368235 Original: T2002009001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0	4	3.7	3.7	92	93	75-125	1	20	
Arsenic	mg/L	0	4	3.8	3.8	95	95	75-125	0	20	
Barium	mg/L	0.27	4	3.9	3.8	96	96	75-125	0	20	
Cadmium	mg/L	5e-005	4	3.5	3.5	87	87	75-125	0	20	
Chromium	mg/L	0.017	4	3.7	3.7	93	93	75-125	0	20	
Copper	mg/L	0	4	3.9	3.9	97	97	75-125	0	20	
Lead	mg/L	0	4	3.3	3.3	84	84	75-125	0	20	
Selenium	mg/L	0.066	4	3.7	3.6	92	90	75-125	2	20	

QC Batch: DGMt/1144 Analysis Method: SW-846 6010

QC Batch Method: SW-846 3010A Prepared: 01/31/2020 10:00

Associated Lab Samples: F2000467013, F2000467014, F2000467016, F2000467017

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3368297

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Copper	mg/L	0.014	0.014	U

LABORATORY CONTROL SAMPLE: 3368298

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	4.4	111	80-120	
Arsenic	mg/L	4	4.6	116	80-120	
Barium	mg/L	4	4.3	109	80-120	
Cadmium	mg/L	4	4.4	111	80-120	
Chromium	mg/L	4	4.4	111	80-120	
Copper	mg/L	4	4.7	118	80-120	
Lead	mg/L	4	4.2	105	80-120	
Selenium	mg/L	4	4.5	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368299 3368300 Original: F2000467017

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.0014	4	4.3	4.0	107	100	75-125	7	20	
Arsenic	mg/L	0	4	4.4	4.1	111	103	75-125	7	20	
Barium	mg/L	0.38	4	4.4	4.1	110	103	75-125	7	20	
Cadmium	mg/L	0	4	4.2	3.8	105	96	75-125	8	20	
Chromium	mg/L	0.0026	4	4.2	3.9	105	99	75-125	7	20	
Copper	mg/L	0.049	4	4.6	4.3	113	105	75-125	7	20	
Lead	mg/L	0	4	3.9	3.7	98	91	75-125	7	20	
Selenium	mg/L	0	4	4.3	4.0	107	99	75-125	8	20	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: DGMt/1147 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 01/31/2020 11:00
Associated Lab Samples: F2000467015, F2000467018

METHOD BLANK: 3368654

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3368655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0051	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368656 3368657 Original: T2002009001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0.00022	0.005	0.0054	0.0054	108	107	80-120	0	20	

QC Batch: DGMt/1154 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 02/03/2020 10:00
Associated Lab Samples: F2000467007, F2000467008, F2000467009, F2000467010, F2000467011, F2000467012

METHOD BLANK: 3369710

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE: 3369711

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.4	86	80-120	
Arsenic	mg/L	4	3.5	87	80-120	
Barium	mg/L	4	3.5	88	80-120	
Cadmium	mg/L	4	3.4	85	80-120	
Chromium	mg/L	4	3.5	86	80-120	
Copper	mg/L	4	3.8	95	80-120	
Selenium	mg/L	4	3.3	83	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3369712 3369713 Original: F2000467007

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.0036	4	3.7	3.7	92	93	75-125	1	20	
Arsenic	mg/L	0	4	3.8	3.8	94	95	75-125	1	20	
Barium	mg/L	0.22	4	3.9	3.9	97	98	75-125	1	20	
Cadmium	mg/L	0	4	3.7	3.8	93	94	75-125	1	20	
Chromium	mg/L	0.0028	4	3.7	3.7	92	93	75-125	1	20	
Copper	mg/L	0.02	4	4.0	4.1	100	101	75-125	1	20	
Lead	mg/L	0	4	3.4	3.4	86	86	75-125	0	20	
Selenium	mg/L	0	4	3.6	3.6	89	91	75-125	2	20	

QC Batch: DGMt/1156 Analysis Method: SW-846 7470A

QC Batch Method: SW-846 7470A Prepared: 02/03/2020 11:00

Associated Lab Samples: F2000467013, F2000467014, F2000467016, F2000467017

METHOD BLANK: 3370208

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3370209

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0054	107	80-120	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3370210 3370211 Original: F2000467013

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0	0.005	0.0050	0.0050	101	99	80-120	2	20	

QC Batch: DGMt/1157 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 02/03/2020 11:00
Associated Lab Samples: F2000467007, F2000467008, F2000467009, F2000467010, F2000467011, F2000467012

METHOD BLANK: 3370217

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3370218

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0051	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3370219 3370220 Original: F2000467007

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0.00052	0.005	0.0054	0.0058	99	106	80-120	7	20	

QC Batch: DGMt/1166 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 02/04/2020 10:00
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3371104

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

LABORATORY CONTROL SAMPLE: 3371105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.2	81	80-120	
Arsenic	mg/L	4	3.7	91	80-120	
Barium	mg/L	4	3.4	85	80-120	
Cadmium	mg/L	4	3.5	86	80-120	
Chromium	mg/L	4	3.4	86	80-120	
Copper	mg/L	4	3.6	89	80-120	
Selenium	mg/L	4	3.6	91	80-120	

LABORATORY CONTROL SAMPLE: 3371105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	mg/L	4	3.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3371106 3371107 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.012	4	2.9	2.9	72	71	75-125	1	20	
Arsenic	mg/L	0	4	3.3	3.3	82	82	75-125	0	20	
Barium	mg/L	0.22	4	3.2	3.2	79	79	75-125	0	20	
Cadmium	mg/L	0	4	3.1	3.0	76	76	75-125	0	20	
Chromium	mg/L	0.0037	4	3.0	3.0	76	76	75-125	0	20	
Copper	mg/L	0.012	4	3.2	3.2	79	79	75-125	0	20	
Lead	mg/L	0	4	2.7	2.7	69	68	75-125	0	20	
Selenium	mg/L	0	4	3.2	3.1	80	78	75-125	2	20	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: DGMt/1171 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 02/04/2020 10:00
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006

METHOD BLANK: 3371652

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3371653

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0047	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3371654 3371655 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0	0.005	0.0049	0.0045	97	91	80-120	7	20	

QC Batch: MSVt/1208 Analysis Method: SW-846 8260B
QC Batch Method: SW-846 5030B Prepared: 02/05/2020 15:04
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006, F2000467007,

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Dichlorodifluoromethane	ug/L	0.36	0.36	U
Chloromethane	ug/L	0.53	0.53	U
Vinyl Chloride	ug/L	0.20	0.20	U
Bromomethane	ug/L	0.97	0.97	U
Chloroethane	ug/L	0.38	0.38	U
Trichlorofluoromethane	ug/L	0.84	0.84	U
Acrolein (Propenal)	ug/L	3.5	3.5	U
Acetone	ug/L	1.0	1.0	U
1,1-Dichloroethylene	ug/L	0.70	0.70	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Iodomethane (Methyl Iodide)	ug/L	0.65	0.65	U
Acrylonitrile	ug/L	1.9	1.9	U
Methylene Chloride	ug/L	4.0	1.0	
Carbon Disulfide	ug/L	0.49	0.49	U
trans-1,2-Dichloroethylene	ug/L	0.50	0.50	U
Methyl tert-butyl Ether (MTBE)	ug/L	0.41	0.41	U
1,1-Dichloroethane	ug/L	0.86	0.86	U
Vinyl Acetate	ug/L	0.40	0.40	U
2-Butanone (MEK)	ug/L	0.59	0.59	U
cis-1,2-Dichloroethylene	ug/L	0.51	0.51	U
Bromochloromethane	ug/L	0.33	0.33	U
Chloroform	ug/L	0.31	0.31	U
2,2-Dichloropropane	ug/L	0.82	0.82	U
1,2-Dichloroethane	ug/L	0.60	0.60	U
1,1,1-Trichloroethane	ug/L	0.44	0.44	U
1,1-Dichloropropene	ug/L	0.39	0.39	U
Carbon Tetrachloride	ug/L	0.60	0.60	U
Benzene	ug/L	0.20	0.20	U
Dibromomethane	ug/L	0.76	0.76	U
1,2-Dichloropropane	ug/L	0.76	0.76	U
Trichloroethene	ug/L	0.60	0.60	U
Bromodichloromethane	ug/L	0.60	0.60	U
2-Chloroethyl Vinyl Ether	ug/L	0.58	0.58	U
cis-1,3-Dichloropropene	ug/L	0.20	0.20	U
4-Methyl-2-pentanone (MIBK)	ug/L	0.93	0.93	U
trans-1,3-Dichloropropylene	ug/L	0.20	0.20	U
1,1,2-Trichloroethane	ug/L	0.46	0.46	U
Toluene	ug/L	0.45	0.45	U
1,3-Dichloropropane	ug/L	0.40	0.40	U
2-Hexanone	ug/L	0.99	0.99	U
Dibromochloromethane	ug/L	0.40	0.40	U
Ethylene Dibromide (EDB)	ug/L	0.67	0.67	U
Tetrachloroethylene (PCE)	ug/L	0.60	0.60	U
1,1,1,2-Tetrachloroethane	ug/L	0.64	0.64	U
Chlorobenzene	ug/L	0.56	0.56	U
Ethylbenzene	ug/L	0.26	0.26	U
Bromoform	ug/L	0.88	0.88	U
Styrene	ug/L	0.84	0.84	U
1,1,2,2-Tetrachloroethane	ug/L	0.20	0.20	U
1,2,3-Trichloropropane	ug/L	0.58	0.58	U
Isopropylbenzene	ug/L	0.80	0.80	U
Bromobenzene	ug/L	0.73	0.73	U
n-propylbenzene	ug/L	0.48	0.48	U
2-Chlorotoluene	ug/L	0.49	0.49	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
4-Chlorotoluene	ug/L	0.44	0.44	U
1,3,5-Trimethylbenzene	ug/L	0.68	0.68	U
tert-butylbenzene	ug/L	0.53	0.53	U
1,2,4-Trimethylbenzene	ug/L	0.54	0.54	U
sec-butylbenzene	ug/L	0.38	0.38	U
1,3-Dichlorobenzene	ug/L	0.43	0.43	U
1,4-Dichlorobenzene	ug/L	0.97	0.97	U
1,2-Dichlorobenzene	ug/L	0.63	0.63	U
n-Butylbenzene	ug/L	0.64	0.64	U
1,2-Dibromo-3-Chloropropane	ug/L	2.3	2.3	U
1,2,4-Trichlorobenzene	ug/L	0.84	0.84	U
Naphthalene	ug/L	0.73	0.73	U
Hexachlorobutadiene	ug/L	0.40	0.40	U
1,2,3-Trichlorobenzene	ug/L	0.86	0.86	U
Xylene (Total)	ug/L	0.56	0.56	U
1,2-Dichloroethane-d4 (S)	%	110	70-128	
Toluene-d8 (S)	%	99	77-119	
Bromofluorobenzene (S)	%	108	86-123	

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Dichlorodifluoromethane	ug/L	20	20	18	101	91		10		
Chloromethane	ug/L	20	20	18	101	88		13		
Vinyl Chloride	ug/L	20	19	18	95	89	70-130	6	20	
Bromomethane	ug/L	20	22	20	108	99		9		
Chloroethane	ug/L	20	20	19	100	93		7		
Trichlorofluoromethane	ug/L	20	23	21	116	103		12		
Acrolein (Propenal)	ug/L	100	110	100	109	104		5		
Acetone	ug/L	20	24	20	119	100		18		
1,1-Dichloroethylene	ug/L	20	20	20	99	98	70-130	2	20	
Iodomethane (Methyl Iodide)	ug/L	20	18	12	88	58		41		
Acrylonitrile	ug/L	20	20	19	98	96		3		
Methylene Chloride	ug/L	20	23	23	113	97		4		
Carbon Disulfide	ug/L	20	19	19	97	94		4		
trans-1,2-Dichloroethylene	ug/L	20	19	19	97	95		1		
Methyl tert-butyl Ether (MTBE)	ug/L	20	19	19	96	97	70-130	2	20	
1,1-Dichloroethane	ug/L	20	19	19	97	97		0		
Vinyl Acetate	ug/L	20	33	33	163	166		2		
2-Butanone (MEK)	ug/L	20	19	19	95	97		2		

CERTIFICATE OF ANALYSIS

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
cis-1,2-Dichloroethylene	ug/L	20	20	19	98	96	70-130	1	20	
Bromochloromethane	ug/L	20	21	20	104	100		4		
Chloroform	ug/L	20	19	19	96	95	70-130	1	20	
2,2-Dichloropropane	ug/L	20	21	20	107	102		5		
1,2-Dichloroethane	ug/L	20	19	20	97	99		2		
1,1,1-Trichloroethane	ug/L	20	19	19	96	94		2		
1,1-Dichloropropene	ug/L	20	19	18	95	92		3		
Carbon Tetrachloride	ug/L	20	19	18	93	92		1		
Benzene	ug/L	20	19	18	96	92	70-130	4	20	
Dibromomethane	ug/L	20	20	19	98	93		4		
1,2-Dichloropropane	ug/L	20	19	18	96	90		7		
Trichloroethene	ug/L	20	18	18	93	88	70-130	5	20	
Bromodichloromethane	ug/L	20	19	19	96	93		3		
2-Chloroethyl Vinyl Ether	ug/L	20	21	20	104	98		6		
cis-1,3-Dichloropropene	ug/L	20	20	19	99	95		5		
4-Methyl-2-pentanone (MIBK)	ug/L	20	19	19	95	97		2		
trans-1,3-Dichloropropylene	ug/L	20	20	19	100	97		3		
1,1,2-Trichloroethane	ug/L	20	19	18	96	91		5		
Toluene	ug/L	20	19	19	96	93	70-130	3	20	
1,3-Dichloropropane	ug/L	20	19	19	97	94		3		
2-Hexanone	ug/L	20	19	19	97	97		0		
Dibromochloromethane	ug/L	20	19	18	95	88		8		
Ethylene Dibromide (EDB)	ug/L	20	19	18	95	92		3		
Tetrachloroethylene (PCE)	ug/L	20	19	19	96	94	70-130	2	20	
1,1,1,2-Tetrachloroethane	ug/L	20	19	18	94	92		3		
Chlorobenzene	ug/L	20	20	19	98	93	70-130	6	20	
Ethylbenzene	ug/L	20	20	19	98	94	70-130	4	20	
Bromoform	ug/L	20	19	18	96	88		9		
Styrene	ug/L	20	20	18	98	90		9		
1,1,2,2-Tetrachloroethane	ug/L	20	22	20	108	102		6		
1,2,3-Trichloropropane	ug/L	20	21	19	104	95		8		
Isopropylbenzene	ug/L	20	19	19	97	96		1		
Bromobenzene	ug/L	20	21	20	103	98		5		
n-propylbenzene	ug/L	20	20	20	102	99		3		
2-Chlorotoluene	ug/L	20	20	19	99	96		3		
4-Chlorotoluene	ug/L	20	22	21	109	104		5		
1,3,5-Trimethylbenzene	ug/L	20	20	19	99	96		3		
tert-butylbenzene	ug/L	20	20	19	100	96		4		
1,2,4-Trimethylbenzene	ug/L	20	20	19	99	96	70-130	4	20	
sec-butylbenzene	ug/L	20	20	19	98	95		3		
1,3-Dichlorobenzene	ug/L	20	21	20	103	98	70-130	6	20	
1,4-Dichlorobenzene	ug/L	20	21	20	104	98		7		
1,2-Dichlorobenzene	ug/L	20	21	19	103	97	70-130	6	20	
n-Butylbenzene	ug/L	20	21	20	107	101		6		

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-Chloropropane	ug/L	20	23	22	116	108		7		
1,2,4-Trichlorobenzene	ug/L	20	21	20	106	100		6		
Naphthalene	ug/L	20	20	19	101	95		7		
Hexachlorobutadiene	ug/L	20	21	21	106	104		2		
1,2,3-Trichlorobenzene	ug/L	20	21	19	104	96		8		
Xylene (Total)	ug/L	60	59	56	99	94	70-130	5	20	
1,2-Dichloroethane-d4 (S)	%				99	104	70-128	5		
Toluene-d8 (S)	%				98	99	77-119	1		
Bromofluorobenzene (S)	%				101	104	86-123	3		

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Dichlorodifluoromethane	ug/L	0	200	390	136		
Chloromethane	ug/L	0	200	490	170		
Vinyl Chloride	ug/L	0	200	480	166	70-130	
Bromomethane	ug/L	0	200	500	173		
Chloroethane	ug/L	0	200	500	172		
Trichlorofluoromethane	ug/L	0	200	510	177		
Acrolein (Propenal)	ug/L	0	1000	1700	121		
Acetone	ug/L	90	200	580	155		
1,1-Dichloroethylene	ug/L	0	200	360	124	70-130	
Iodomethane (Methyl Iodide)	ug/L	0	200	260	91		
Acrylonitrile	ug/L	0	200	370	127		
Methylene Chloride	ug/L	8	200	430	148		
Carbon Disulfide	ug/L	0	200	310	108		
trans-1,2-Dichloroethylene	ug/L	0	200	360	124		
Methyl tert-butyl Ether (MTBE)	ug/L	0	200	390	134	70-130	
1,1-Dichloroethane	ug/L	0	200	350	120		
Vinyl Acetate	ug/L	0	200	690	239		
2-Butanone (MEK)	ug/L	4.1	200	390	134		
cis-1,2-Dichloroethylene	ug/L	0	200	370	127	70-130	
Bromochloromethane	ug/L	0	200	380	132		
Chloroform	ug/L	0	200	340	117	70-130	
2,2-Dichloropropane	ug/L	0	200	370	129		
1,2-Dichloroethane	ug/L	0	200	420	146		
1,1,1-Trichloroethane	ug/L	0	200	370	128		
1,1-Dichloropropene	ug/L	0	200	360	124		
Carbon Tetrachloride	ug/L	0	200	370	127		

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	0	200	340	117	70-130	
Dibromomethane	ug/L	0	200	340	117		
1,2-Dichloropropane	ug/L	0	200	360	125		
Trichloroethene	ug/L	0	200	320	111	70-130	
Bromodichloromethane	ug/L	0	200	360	125		
2-Chloroethyl Vinyl Ether	ug/L	0	200	360	125		
cis-1,3-Dichloropropene	ug/L	0	200	410	143		
4-Methyl-2-pentanone (MIBK)	ug/L	12	200	440	146		
trans-1,3-Dichloropropylene	ug/L	0	200	370	129		
1,1,2-Trichloroethane	ug/L	0	200	310	108		
Toluene	ug/L	0	200	320	112	70-130	
1,3-Dichloropropane	ug/L	0	200	370	127		
2-Hexanone	ug/L	0	200	580	200		
Dibromochloromethane	ug/L	0	200	310	109		
Ethylene Dibromide (EDB)	ug/L	0	200	320	111		
Tetrachloroethylene (PCE)	ug/L	0	200	370	127	70-130	
1,1,1,2-Tetrachloroethane	ug/L	0	200	310	107		
Chlorobenzene	ug/L	0	200	310	109	70-130	
Ethylbenzene	ug/L	0	200	340	117	70-130	
Bromoform	ug/L	0	200	370	127		
Styrene	ug/L	0	200	320	112		
1,1,2,2-Tetrachloroethane	ug/L	0	200	380	130		
1,2,3-Trichloropropane	ug/L	0	200	370	130		
Isopropylbenzene	ug/L	0	200	280	96		
Bromobenzene	ug/L	0	200	310	109		
n-propylbenzene	ug/L	0	200	300	104		
2-Chlorotoluene	ug/L	0	200	290	101		
4-Chlorotoluene	ug/L	0	200	330	115		
1,3,5-Trimethylbenzene	ug/L	0	200	280	99		
tert-butylbenzene	ug/L	0	200	270	95		
1,2,4-Trimethylbenzene	ug/L	0	200	290	101	70-130	
sec-butylbenzene	ug/L	0	200	280	98		
1,3-Dichlorobenzene	ug/L	0	200	300	106	70-130	
1,4-Dichlorobenzene	ug/L	0	200	300	104		
1,2-Dichlorobenzene	ug/L	0	200	290	101	70-130	
n-Butylbenzene	ug/L	0	200	310	107		
1,2-Dibromo-3-Chloropropane	ug/L	0	200	350	120		
1,2,4-Trichlorobenzene	ug/L	0	200	350	122		
Naphthalene	ug/L	0	200	260	89		
Hexachlorobutadiene	ug/L	0	200	360	124		
1,2,3-Trichlorobenzene	ug/L	0	200	330	113		
Xylene (Total)	ug/L	0	600	1000	120	70-130	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%	113			134	69-134	
Toluene-d8 (S)	%	104			105	72-122	
Bromofluorobenzene (S)	%	110			96	79-126	

QUALITY CONTROL DATA QUALIFIERS

Workorder: F2000467 LCU PLANTS DEMO

QUALITY CONTROL PARAMETER QUALIFIERS

U The compound was analyzed for but not detected.

I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

V Method Blank Contamination

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467001	FMBWWTP D6U			EPA 9056	WCAf/1070
F2000467002	FMBWWTP D6L			EPA 9056	WCAf/1070
F2000467003	FMBWWTP D5U			EPA 9056	WCAf/1070
F2000467004	FMBWWTP D5L			EPA 9056	WCAf/1070
F2000467005	FMBWWTP D4U			EPA 9056	WCAf/1070
F2000467006	FMBWWTP D4L			EPA 9056	WCAf/1070
F2000467007	FMBWWTP D3U			EPA 9056	WCAf/1070
F2000467008	FMBWWTP D3L			EPA 9056	WCAf/1070
F2000467009	FMBWWTP D2U			EPA 9056	WCAf/1070
F2000467010	FMBWWTP D2L			EPA 9056	WCAf/1070
F2000467011	FMBWWTP D9			EPA 9056	WCAf/1071
F2000467012	SCWWTP-D-4			EPA 9056	WCAf/1071
F2000467013	SCWWTP-D-2/2.5FT			EPA 9056	WCAf/1071
F2000467014	SCWWTP-D-3 / 2.5FT			EPA 9056	WCAf/1071
F2000467015	WWEWTP D-9			EPA 9056	WCAf/1071
F2000467016	WWEWTP D-1 DEEP			EPA 9056	WCAf/1071
F2000467017	WWEWTP D-1 TROUGH			EPA 9056	WCAf/1071
F2000467018	WWEWTP D-2			EPA 9056	WCAf/1071
F2000467001	FMBWWTP D6U			SM 2540G	WCAf/1077
F2000467002	FMBWWTP D6L			SM 2540G	WCAf/1077
F2000467003	FMBWWTP D5U			SM 2540G	WCAf/1077
F2000467004	FMBWWTP D5L			SM 2540G	WCAf/1077
F2000467005	FMBWWTP D4U			SM 2540G	WCAf/1077
F2000467006	FMBWWTP D4L			SM 2540G	WCAf/1077
F2000467007	FMBWWTP D3U			SM 2540G	WCAf/1077
F2000467008	FMBWWTP D3L			SM 2540G	WCAf/1077
F2000467009	FMBWWTP D2U			SM 2540G	WCAf/1077
F2000467010	FMBWWTP D2L			SM 2540G	WCAf/1077
F2000467011	FMBWWTP D9			SM 2540G	WCAf/1077
F2000467012	SCWWTP-D-4			SM 2540G	WCAf/1077
F2000467013	SCWWTP-D-2/2.5FT			SM 2540G	WCAf/1077
F2000467014	SCWWTP-D-3 / 2.5FT			SM 2540G	WCAf/1077

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467015	WWEWTP D-9			SM 2540G	WCAf/1077
F2000467016	WWEWTP D-1 DEEP			SM 2540G	WCAf/1077
F2000467017	WWEWTP D-1 TROUGH			SM 2540G	WCAf/1077
F2000467018	WWEWTP D-2			SM 2540G	WCAf/1077
F2000467015	WWEWTP D-9	SW-846 3010A	DGMt/1143	SW-846 6010	ICPt/1090
F2000467018	WWEWTP D-2	SW-846 3010A	DGMt/1143	SW-846 6010	ICPt/1090
F2000467013	SCWWTP-D-2/2.5FT	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467014	SCWWTP-D-3 / 2.5FT	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467016	WWEWTP D-1 DEEP	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467017	WWEWTP D-1 TROUGH	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467015	WWEWTP D-9	SW-846 7470A	DGMt/1147	SW-846 7470A	CVAt/1046
F2000467018	WWEWTP D-2	SW-846 7470A	DGMt/1147	SW-846 7470A	CVAt/1046
F2000467007	FMBWWTP D3U	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467008	FMBWWTP D3L	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467009	FMBWWTP D2U	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467010	FMBWWTP D2L	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467011	FMBWWTP D9	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467012	SCWWTP-D-4	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467013	SCWWTP-D-2/2.5FT	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467014	SCWWTP-D-3 / 2.5FT	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467016	WWEWTP D-1 DEEP	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467017	WWEWTP D-1 TROUGH	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467007	FMBWWTP D3U	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467008	FMBWWTP D3L	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467009	FMBWWTP D2U	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467010	FMBWWTP D2L	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467011	FMBWWTP D9	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467012	SCWWTP-D-4	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467001	FMBWWTP D6U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467002	FMBWWTP D6L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467003	FMBWWTP D5U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467004	FMBWWTP D5L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467005	FMBWWTP D4U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467006	FMBWWTP D4L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467001	FMBWWTP D6U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467002	FMBWWTP D6L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467003	FMBWWTP D5U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467004	FMBWWTP D5L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467005	FMBWWTP D4U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467006	FMBWWTP D4L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467001	FMBWWTP D6U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467002	FMBWWTP D6L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467003	FMBWWTP D5U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467004	FMBWWTP D5L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467005	FMBWWTP D4U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467006	FMBWWTP D4L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467007	FMBWWTP D3U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467008	FMBWWTP D3L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467009	FMBWWTP D2U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467010	FMBWWTP D2L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467011	FMBWWTP D9	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209

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6681 Southpoint Parkway
Jacksonville, Florida 32216
Office (904) 363-9350
Fax (904) 363-9354

Queue: ICPt

Batch Number: 1102

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: All holding times were met.

III. Method

Analysis: SW-846 6010

Preparation: SW-846 3010A

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Duplicates: All acceptance criteria were met.

D. Spikes: The matrix spike (MS) recoveries of silver and lead for F2000467001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in this matrix. The affected sample is qualified to indicate matrix interference.

E. Serial Diluion: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

G. Other:

Advanced Environmental Laboratories, Inc.

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Fax (904) 363-9354

Queue: MSVt

Batch Number: 1209

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: All holding times were met.

III. Method

Analysis: SW-846 8260B

Preparation: SW-846 5030B

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: The Method Blank (MB) contained low levels of Methylene Chloride above the Method Detection Limit (MDL), a known laboratory contaminant. In accordance with AEL QA, all sample results found in the Method Blank are flagged with a V qualifier to indicate the data is an estimate. Samples F2000467001-11 are considered affected.

C. Surrogates:

D. Spikes: The matrix spike recoveries of Vinyl Chloride and Methyl tert-butyl Ether (MTBE) for F2000467001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS), Laboratory Control Sample Duplicate (LCSD) and %RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. The associated sample is qualified with a J4 to indicate an estimated result.

E. Internal Standard: All acceptance criteria were met.

F. Samples: TCLP samples F2000467001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011 were analyzed at the lowest dilution. In accordance with AEL protocol, all TCLP samples require a minimal dilution of 10X prior to analysis due to the complex matrices produced during the preparation method.

G. Other:

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☒ Fort Myers: 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Fax 239.674.8128 Lab ID: E
☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Fax 904.363.9354 Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E

52.377.2349 • Fax 352.395.6639 Lab ID: E82001
54.889.2288 • Fax 954.889.2281 Lab ID: E82535
13.630.9616 • Fax 813.630.4327 Lab ID: E84589

* F 2 0 0 0 4 6 7 *

Client Name: GHD	Project Name: LCU Plants Demo
Address: 5904 Hampton Oak Pkwy	Project Number: 11207990
Tampa, FL	PO Number:
Phone: 813-971-3882	FDEP Facility No:
FAX: 813-971-1862	FDEP Facility Address:
Contact: Jennifer Rogers	
Sampled By: W. McKinney	Special Instructions: 5* mix of soil/gravel/anthracite
Turn Around Time: ☒ STANDARD ☐ RUSH	
AEL Profile #:	☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED: TCLP VOC	TCLP metals(RCRA8 and copper)	total Sulfate	Preservation	Field-Filtered?	LABORATORY I.D. NUMBER
FMB WWTP	D6 U	G	1.27.20	9:40	S*			✓	✓	✓			001
FMB WWTP	D6 L	"	"	9:50	S*			✓	✓	✓			002
FMB WWTP	D5 U	"	"	10:20				✓	✓	✓			003
FMB WWTP	D5 L	"	"	10:30				✓	✓	✓			004
FMB WWTP	D4 U	"	"	11:20				✓	✓	✓			005
FMB WWTP	D4 L	"	"	11:30				✓	✓	✓			006
FMB WWTP	D3 U	"	"	12:15				✓	✓	✓			007
FMB WWTP	D3 L	"	"	12:25				✓	✓	✓			008
FMB WWTP	D2 U	"	"	13:15				✓	✓	✓			009
FMB WWTP	D2 L	"	"	13:25	↓			✓	✓	✓			010

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☐ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked

Temp. when received (observed) 5.9 °C Temp. when received (corrected) 5.9 °C

DCN: AD-051 Form last revised 02/12/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McKinney	1.27.20	16:00	[illegible]	1/27/20	1300
2	[illegible]	1/27/20	1310	[illegible]	1/29/20	1310
3						
4						

FOR DRINKING WATER USE:

(When PWS Information not otherwise supplied) PWS ID: _____

Contact Person: _____ Phone: _____

Supplier of Water: _____

Site-Address: _____

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☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Fax 904.363.9354 Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E811095
☐ Gainesville: 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Fax 352.395.6639 Lab ID: E82001
☐ Miramar: 10200 USA Today Way, FL 33025 • 954.889.2288 • Fax 954.889.2281 Lab ID: E82535
☐ Tampa: 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Fax 813.630.4327 Lab ID: E84589

F2000467 Page 1 of 1

Client Name: GHD
Address: 5904 Hampton Oak Pkwy
Tampa, FL
Phone: 813-971-3882
FAX: 813-971-1862
Contact: Jennifer Rogers
Sampled By: W. McKinney
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile #:

Project Name: LCU Plants Demo
Project Number: 11207990
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions: S* = soil/sand/anthracite/gravel media
☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED: TCLP VOC	TCLP metals (RCRA8) and copper	total sulfate	LABORATORY I.D. NUMBER
	Preservation										
	Field-Filtered?										
FMB WWTP	D-9	C	1-27-20	14:00	S*			✓	✓	✓	011

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge
Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☑ Yes ☐ No ☑ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked
Temp. when received (observed) 3.7 °C Temp. when received (corrected) 3.7 °C

DCN: AD-051 Form last revised 02/12/2019
Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McK	1-27-20	16:00		1/27/20	1300
2		1/27/20	1310		1/29/20	1310
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID:
Contact Person: Phone :
Supplier of Water:
Site-Address:

Advanced Environmental Laboratories, Inc.
Florida's Largest Laboratory Network

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☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Fax 904.363.9354 Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E811095
☐ Gainesville: 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Fax 352.395.6639 Lab ID: E82001
☐ Miramar: 10200 USA Today Way, FL 33025 • 954.889.2288 • Fax 954.889.2281 Lab ID: E82535
☐ Tampa: 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Fax 813.630.4327 Lab ID: E84589

F2000467 Page 1 of 1

Client Name: GHD
Address: 5904 Hampton Oak Pkwy.
Tampa, FL
Phone: 813-971-3882
FAX: 813-971-1862
Contact: Jennifer Rogers
Sampled By: W. McKinney
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile #:

Project Name: LCU Plants Demo
Project Number: 11207990
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED (RCRA 8 + copper)	TCLP Metals	Total Sulfate	LABORATORY I.D. NUMBER
							Preservation				
							Field-Filtered?				
SCWWTP -	D-4	G	1-28-20	10:30	SO	2		✓	✓		012
SCWWTP -	D-2/2.5'	"	"	12:15	"	2		✓	✓		013
SCWWTP	D-3/2.5'	"	"	12:40	"	2		✓	✓		014
WWEWTP	D-9	"	"	15:10	"	2		✓	✓		015
WWEWTP	D-1 Deep	"	"	16:00	"	2		✓	✓		016
WWE WTP	D-1 Trough	"	"	15:45	"	2		✓	✓		017
WWE WTP	D-2	"	1-29-20	8:50	"	2		✓	✓		018

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☒ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked

Temp. when received (observed) 5.7 °C Temp. when received (corrected) 5.8 °C

DCN: AD-051 Form last revised 02/12/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McK	1-29-20	12:30		1/27/20	1300
2		1/27/20	1310		1/29/20	1310
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID:
Contact Person: Phone :
Supplier of Water:
Site-Address:

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118
www.jupiterlabs.com
clientservices@jupiterlabs.com

February 10, 2020

Jennifer Rogers
GHD - Tampa
5904 Hampton Oaks Pkwy
Suite F
Tampa, FL

RE: LOG# 2066569
Project ID: LCU Plants Demo 11207790
COC# 2066569

Dear Jennifer Rogers:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, January 30, 2020. Results reported herein conform to the most current NELAC standards, where applicable, unless indicated by * in the body of the report. The enclosed Chain of Custody is a component of this package and should be retained with the package and incorporated therein.

Results for all solid matrices are reported in dry weight unless otherwise noted. Results for all liquid matrices are reported as received in the laboratory unless otherwise noted. Results relate only to the samples received. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

Samples are disposed of after 30 days of their receipt by the laboratory unless extended storage is requested in writing. The laboratory maintains the right to charge storage fees for archived samples. This report will be archived for 5 years after which time it will be destroyed without further notice, unless prior arrangements have been made.

Certain analyses are subcontracted to outside NELAC certified laboratories, please see the Project Summary section of this report for NELAC certification numbers of laboratories used. A Statement of Qualifiers is available upon request.

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

Sincerely,

John Heyman for
Kacia Baldwin
V.P. of Operations

FDOH# E86546

CERTIFICATE OF ANALYSIS

CASE NARRATIVE

Jupiter Environmental Laboratories Inc. Lab Reference No./SDG: 2066569

Client: GHD Tampa

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. METHODS

Samples were analyzed according to JEL's Standard Operating Procedures for following Method(s):
EPA 1311 (TCLP), EPA 8260C (TCLP), EPA 8270C (TCLP), SM 2540G

III. Analysis

Sample analysis proceeded normally with the exception of following:

Exceptions:

Method: EPA 8270C (TCLP)

Flag: J2|Surrogate recovery was outside defined limits due to matrix interference.
Following Samples/Analytes were flagged:

- LabID: 2066569001; SampleID: SCWWTP D-4
  Analytes: Nitrobenzene-d5

- LabID: 2066569002; SampleID: SCWWTP D-2/2.5'
  Analytes: 2,4,6-Tribromophenol; 2-Fluorobiphenyl; 2-Fluorophenol; Nitrobenzene-d5; Phenol-d5; p-Terphenyl-d14

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Jupiter Environmental Laboratories, Inc., both technically and for completeness, for other than the conditions detailed in the SDG Narrative. Release of the data contained in this hardcopy data package and in the electronic data submitted has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

SIGNED: DATE: 2/10/20

John Heyman for
Kacia Baldwin
V.P. of Operations

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

SAMPLE ANALYTE COUNT

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	Method	Analytes Reported
2066569001	SCWWTP D-4	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569002	SCWWTP D-2/2.5'	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569003	SCWWTP D-3/2.5'	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569004	WWE WTP D-9	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569005	WWE WTP D-1 Deep	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569006	WWE WTP D-1 Trough	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569007	WWE WTP D-2	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

SAMPLE SUMMARY

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2066569001	SCWWTP D-4	Soil/Solid	1/28/2020 10:30	1/30/2020 08:30
2066569002	SCWWTP D-2/2.5'	Soil/Solid	1/28/2020 12:15	1/30/2020 08:30
2066569003	SCWWTP D-3/2.5'	Soil/Solid	1/28/2020 12:40	1/30/2020 08:30
2066569004	WWE WTP D-9	Soil/Solid	1/28/2020 15:10	1/30/2020 08:30
2066569005	WWE WTP D-1 Deep	Soil/Solid	1/28/2020 16:00	1/30/2020 08:30
2066569006	WWE WTP D-1 Trough	Soil/Solid	1/28/2020 15:45	1/30/2020 08:30
2066569007	WWE WTP D-2	Soil/Solid	1/29/2020 08:50	1/30/2020 08:30

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569001** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **SCWWTP D-4** Date Collected: 1/28/2020 10:30

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B				
						Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Dibromofluoromethane (S)	96	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Toluene d8 (S)	98	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
4-Bromofluorobenzene (S)	98	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:02	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C				
						Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
2-Fluorophenol (S)	55	%	20-110		1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Phenol-d5 (S)	41	%	10-110		1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Nitrobenzene-d5 (S)	111	%	30-110		1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	J2
2-Fluorobiphenyl (S)	78	%	40-110		1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
2,4,6-Tribromophenol (S)	76	%	10-120		1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
p-Terphenyl-d14 (S)	92	%	30-140		1	2/5/2020 10:09	LAL	2/6/2020 19:21	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569001** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **SCWWTP D-4** Date Collected: 1/28/2020 10:30

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	99.6	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569002** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **SCWWTP D-2/2.5'** Date Collected: 1/28/2020 12:15

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B				
						Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Dibromofluoromethane (S)	94	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Toluene d8 (S)	98	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
4-Bromofluorobenzene (S)	99	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:27	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C				
						Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	
2-Fluorophenol (S)	7	%	20-110		1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	J2
Phenol-d5 (S)	5	%	10-110		1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	J2
Nitrobenzene-d5 (S)	6	%	30-110		1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	J2
2-Fluorobiphenyl (S)	4	%	40-110		1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	J2
2,4,6-Tribromophenol (S)	0	%	10-120		1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	J2
p-Terphenyl-d14 (S)	4	%	30-140		1	2/5/2020 11:42	LAL	2/6/2020 19:59	VS	J2
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569002** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **SCWWTP D-2/2.5'** Date Collected: 1/28/2020 12:15

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	44.6	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569003** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **SCWWTP D-3/2.5'** Date Collected: 1/28/2020 12:40

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B				
						Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Dibromofluoromethane (S)	96	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Toluene d8 (S)	98	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
4-Bromofluorobenzene (S)	101	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 15:51	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C				
						Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
2-Fluorophenol (S)	43	%	20-110		1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Phenol-d5 (S)	32	%	10-110		1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Nitrobenzene-d5 (S)	104	%	30-110		1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
2-Fluorobiphenyl (S)	74	%	40-110		1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
2,4,6-Tribromophenol (S)	61	%	10-120		1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
p-Terphenyl-d14 (S)	82	%	30-140		1	2/5/2020 11:42	LAL	2/6/2020 23:01	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569003** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **SCWWTP D-3/2.5'** Date Collected: 1/28/2020 12:40

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	77.9	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569004** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-9** Date Collected: 1/28/2020 15:10

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Dibromofluoromethane (S)	95	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Toluene d8 (S)	100	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
4-Bromofluorobenzene (S)	97	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2-Fluorophenol (S)	56	%	20-110		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Phenol-d5 (S)	38	%	10-110		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Nitrobenzene-d5 (S)	109	%	30-110		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2-Fluorobiphenyl (S)	78	%	40-110		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2,4,6-Tribromophenol (S)	74	%	10-120		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
p-Terphenyl-d14 (S)	92	%	30-140		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569004** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-9** Date Collected: 1/28/2020 15:10

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	40.6	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569005** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-1 Deep** Date Collected: 1/28/2020 16:00

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B				
						Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Dibromofluoromethane (S)	96	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Toluene d8 (S)	98	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
4-Bromofluorobenzene (S)	98	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C				
						Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2-Fluorophenol (S)	55	%	20-110		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Phenol-d5 (S)	38	%	10-110		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Nitrobenzene-d5 (S)	107	%	30-110		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2-Fluorobiphenyl (S)	80	%	40-110		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2,4,6-Tribromophenol (S)	66	%	10-120		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
p-Terphenyl-d14 (S)	85	%	30-140		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569005** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-1 Deep** Date Collected: 1/28/2020 16:00

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	94.4	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569006** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-1 Trough** Date Collected: 1/28/2020 15:45

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B				
						Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Dibromofluoromethane (S)	94	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Toluene d8 (S)	99	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
4-Bromofluorobenzene (S)	103	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C				
						Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2-Fluorophenol (S)	48	%	20-110		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Phenol-d5 (S)	33	%	10-110		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Nitrobenzene-d5 (S)	109	%	30-110		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2-Fluorobiphenyl (S)	77	%	40-110		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2,4,6-Tribromophenol (S)	74	%	10-120		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
p-Terphenyl-d14 (S)	88	%	30-140		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
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Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569006** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-1 Trough** Date Collected: 1/28/2020 15:45

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	73.6	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569007** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-2** Date Collected: 1/29/2020 08:50

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B				
						Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Dibromofluoromethane (S)	96	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Toluene d8 (S)	99	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
4-Bromofluorobenzene (S)	96	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:30	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C				
						Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
2-Fluorophenol (S)	50	%	20-110		1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Phenol-d5 (S)	33	%	10-110		1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Nitrobenzene-d5 (S)	106	%	30-110		1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
2-Fluorobiphenyl (S)	77	%	40-110		1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
2,4,6-Tribromophenol (S)	64	%	10-120		1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
p-Terphenyl-d14 (S)	86	%	30-140		1	2/5/2020 13:24	LAL	2/7/2020 01:25	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
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Phone: (561)575-0030
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ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569007** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-2** Date Collected: 1/29/2020 08:50

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	62.9	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

PARAMETER QUALIFIERS

J2	Surrogate recovery was outside defined limits due to matrix interference.

PROJECT COMMENTS

2066569	A reported value of U indicates that the compound was analyzed for but not detected above the MDL. A value flagged with an "i" flag indicates that the reported value is between the laboratory method detection limit and the practical quantitation limit.

FDOH# E86546

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

QC Batch: XXX/13211 Analysis Method: EPA 8270C (TCLP)

QC Batch Method: EPA 3510C

Associated Lab Samples: 2066569001, 2066569002, 2066569003, 2066569004, 2066569005, 2066569006, 2066569007, 2066570001, 2066570002, 2066570003, 2066570004, 2066570005, 2066570006, 2066570007, 2066570008, 2066647001, 2066647002

METHOD BLANK: 187663

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Semivolatiles by EPA 8270C				
2-Fluorophenol (S)	%	49	20-110	
Phenol-d5 (S)	%	34	10-110	
Nitrobenzene-d5 (S)	%	105	30-110	
2-Fluorobiphenyl (S)	%	81	40-110	
2,4,6-Tribromophenol (S)	%	80	10-120	
p-Terphenyl-d14 (S)	%	95	30-140	
Pyridine	ug/L	U	2.44	
1,4-Dichlorobenzene	ug/L	U	1.59	
2-Methylphenol	ug/L	U	1.73	
Hexachloroethane	ug/L	U	0.950	
Nitrobenzene	ug/L	U	1.49	
Hexachlorobutadiene	ug/L	U	3.85	
2,4,6-Trichlorophenol	ug/L	U	0.200	
2,4,5-Trichlorophenol	ug/L	U	0.280	
2,4-Dinitrotoluene	ug/L	U	1.54	
Hexachlorobenzene	ug/L	U	1.94	
Pentachlorophenol	ug/L	U	1.58	
3&4-Methylphenol	ug/L	U	1.24	

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Semivolatiles by EPA 8270C				
2-Fluorophenol (S)	%	56	20-110	
Phenol-d5 (S)	%	40	10-110	
Nitrobenzene-d5 (S)	%	115	30-110	
2-Fluorobiphenyl (S)	%	79	40-110	
2,4,6-Tribromophenol (S)	%	82	10-120	
p-Terphenyl-d14 (S)	%	94	30-140	
Pyridine	ug/L	U	2.44	
1,4-Dichlorobenzene	ug/L	U	1.59	
2-Methylphenol	ug/L	U	1.73	
Hexachloroethane	ug/L	U	0.950	
Nitrobenzene	ug/L	U	1.49	
Hexachlorobutadiene	ug/L	U	3.85	
2,4,6-Trichlorophenol	ug/L	U	0.200	
2,4,5-Trichlorophenol	ug/L	U	0.280	
2,4-Dinitrotoluene	ug/L	U	1.54	

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

METHOD BLANK: 187663

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Hexachlorobenzene	ug/L	U	1.94	
Pentachlorophenol	ug/L	U	1.58	
3&4-Methylphenol	ug/L	U	1.24	

LABORATORY CONTROL SAMPLE & LCSD: 187664 187665

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Semivolatiles by EPA 8270C										
2-Fluorophenol (S)	%				45	45	20-110	0	40	
Phenol-d5 (S)	%				32	33	10-110	0	40	
Nitrobenzene-d5 (S)	%				110	105	30-110	5	40	
2-Fluorobiphenyl (S)	%				79	79	40-110	3	40	
2,4,6-Tribromophenol (S)	%				86	82	10-120	3	40	
p-Terphenyl-d14 (S)	%				91	95	30-140	3	40	
Pyridine	ug/L		U	U				0	40	
1,4-Dichlorobenzene	ug/L	25.2	13.0	14.9	52	59	20-100	14	40	
2-Methylphenol	ug/L		U	U				0	40	
Hexachloroethane	ug/L		U	U				0	40	
Nitrobenzene	ug/L		U	U				0	40	
Hexachlorobutadiene	ug/L		U	U				0	40	
2,4,6-Trichlorophenol	ug/L		U	U				0	40	
2,4,5-Trichlorophenol	ug/L		U	U				0	40	
2,4-Dinitrotoluene	ug/L	25.2	18.9	18.3	75	73	30-140	3	40	
Hexachlorobenzene	ug/L		U	U				0	40	
Pentachlorophenol	ug/L	49.6	40.9	39.1	83	79	20-120	5	40	
3&4-Methylphenol	ug/L		U	U				0	40	

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
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Phone: (561)575-0030
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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

QC Batch: VXX/9364 Analysis Method: EPA 8260C (TCLP)

QC Batch Method: EPA 5030B

Associated Lab Samples: 2066569001 2066569002 2066569003 2066569004 2066569005 2066569006 2066569007

METHOD BLANK: 187951

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Volatiles by GC/MS				
Dibromofluoromethane (S)	%	94	70-130	
Toluene d8 (S)	%	95	70-130	
4-Bromofluorobenzene (S)	%	93	70-130	
Vinyl chloride	ug/L	U	0.400	
1,1-Dichloroethene	ug/L	U	0.400	
Methyl ethyl ketone (MEK)	ug/L	U	0.640	
Chloroform	ug/L	U	0.400	
1,2-Dichloroethane	ug/L	U	0.400	
Carbon tetrachloride	ug/L	U	0.400	
Benzene	ug/L	U	0.400	
Trichloroethene	ug/L	U	0.400	
Tetrachloroethene	ug/L	U	0.400	
Chlorobenzene	ug/L	U	0.400	
1,4-Dichlorobenzene	ug/L	U	0.400	

LABORATORY CONTROL SAMPLE & LCSD: 187952 187953

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Volatiles by GC/MS										
Dibromofluoromethane (S)	%				96	101	70-130	5	75	
Toluene d8 (S)	%				97	98	70-130	0.3	75	
4-Bromofluorobenzene (S)	%				91	93	70-130	1	75	
Vinyl chloride	ug/L	49.8	42.6	41.2	86	83	70-135	3	75	
1,1-Dichloroethene	ug/L	49.5	43.8	43.9	88	89	70-135	0.2	75	
Methyl ethyl ketone (MEK)	ug/L	50.2	47.0	42.4	94	85	70-135	10	75	
Chloroform	ug/L	49.7	46.4	46.6	93	94	70-135	0.4	75	
1,2-Dichloroethane	ug/L	49.9	44.3	44.4	89	89	70-135	0.2	75	
Carbon tetrachloride	ug/L	50.3	48.6	49.3	97	98	70-135	1	75	
Benzene	ug/L	49.7	45.9	46.8	92	94	70-135	2	75	
Trichloroethene	ug/L	50	47.0	48.1	94	96	70-135	2	75	
Tetrachloroethene	ug/L	49.9	52.1	51.3	104	103	70-135	2	75	
Chlorobenzene	ug/L	49.9	51.6	51.6	103	103	70-135	0	75	
1,4-Dichlorobenzene	ug/L	50.5	46.3	45.9	92	91	70-135	0.9	75	

FDOH# E86546

CERTIFICATE OF ANALYSIS

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

LABORATORY CONTROL SAMPLE & LCSD: 187954 187955

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Dibromofluoromethane (S)	%				95	96	70-130	1	75	
Toluene d8 (S)	%				95	97	70-130	1	75	
4-Bromofluorobenzene (S)	%				94	96	70-130	1	75	

SAMPLE DUPLICATE: 187956 Original: 2066665005

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Volatiles by GC/MS						
Dibromofluoromethane (S)	%	38.3		3	75	
Toluene d8 (S)	%	37.3		2	75	
4-Bromofluorobenzene (S)	%	37.3		4	75	
Vinyl chloride	ug/L	0	U	0	75	
1,1-Dichloroethene	ug/L	0	U	0	75	
Methyl ethyl ketone (MEK)	ug/L		U			
Chloroform	ug/L	0	U	0	75	
1,2-Dichloroethane	ug/L	0	U	0	75	
Carbon tetrachloride	ug/L	0	U	0	75	
Benzene	ug/L	0	U	0	75	
Trichloroethene	ug/L	0	U	0	75	
Tetrachloroethene	ug/L	0	U	0	75	
Chlorobenzene	ug/L	0	U	0	75	
1,4-Dichlorobenzene	ug/L	0	U	0	75	

SAMPLE DUPLICATE: 187957 Original: 2066667001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Volatiles by GC/MS						
Dibromofluoromethane (S)	%	38.3		0.8	75	
Toluene d8 (S)	%	38.4		0.5	75	
4-Bromofluorobenzene (S)	%	36.6		1	75	
Vinyl chloride	ug/L	0	U	0	75	
1,1-Dichloroethene	ug/L	0	U	0	75	
Methyl ethyl ketone (MEK)	ug/L	0	U	0	75	
Chloroform	ug/L	0	U	0	75	
1,2-Dichloroethane	ug/L	0	U	0	75	
Carbon tetrachloride	ug/L	0	U	0	75	
Benzene	ug/L	0	U	0	75	
Trichloroethene	ug/L	0	U	0	75	
Tetrachloroethene	ug/L	0	U	0	75	

FDOH# E86546

CERTIFICATE OF ANALYSIS

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

SAMPLE DUPLICATE: 187957 Original: 2066667001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Chlorobenzene	ug/L	0	U	0	75	
1,4-Dichlorobenzene	ug/L	0	U	0	75	

FDOH# E86546

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2066569001	**SCWWTP D-4**	SM 2540G	WGR/4296		
2066569002	**SCWWTP D-2/2.5'**	SM 2540G	WGR/4296		
2066569003	**SCWWTP D-3/2.5'**	SM 2540G	WGR/4296		
2066569004	**WWE WTP D-9**	SM 2540G	WGR/4296		
2066569005	**WWE WTP D-1 Deep**	SM 2540G	WGR/4296		
2066569006	**WWE WTP D-1 Trough**	SM 2540G	WGR/4296		
2066569007	**WWE WTP D-2**	SM 2540G	WGR/4296		
2066569001	**SCWWTP D-4**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6906
2066569002	**SCWWTP D-2/2.5'**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6906
2066569003	**SCWWTP D-3/2.5'**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569004	**WWE WTP D-9**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569005	**WWE WTP D-1 Deep**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569006	**WWE WTP D-1 Trough**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569007	**WWE WTP D-2**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569001	**SCWWTP D-4**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569002	**SCWWTP D-2/2.5'**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569003	**SCWWTP D-3/2.5'**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569004	**WWE WTP D-9**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569005	**WWE WTP D-1 Deep**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569006	**WWE WTP D-1 Trough**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569007	**WWE WTP D-2**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter
Environmental Laboratories, Inc.

www.jupiterlabs.com
150 S. Old Dixie Highway, Jupiter, FL 33458
(561) 575-0030 • (888) 287-3218 • clientservices@jupiterlabs.com

J.E.L. Log # 2066569
P.O. # _____
Quote # _____

Company Name GHD
Address 5904 Hampton Oak Pkwy
City Tampa State FL Zip
Sampling Site Address
Attn: Jennifer Rogers Email
Project Name LCU Plants Demo Project # 11207790
Sampler Name/Signature W. McKinney

LAB ANALYSIS

Requested Turnaround Time
Note: Rush requests subject to acceptance by the laboratory
X Standard
___ Expedited
Due___/___/___

#	Sample Label (Client ID)	Collected Date	Collected Time	Matrix Code*	# of Cont	Pres Codes	Parameters: TCLP VOC's Full List	Parameters: TCLP SVOC's	Field Filtered (Y/N)	Comments
1	SCWWTP D-4	1.28.20	10:30	SO	2		✓	✓		
2	SCWWTP D-2/2.5'	"	12:15	"	"		✓	✓		
3	SCWWTP D-3/2.5'	"	12:40	"	"		✓	✓		
4	WWE WTP D-9	"	15:10	"	"		✓	✓		
5	WWE WTP D-1 Deep	"	16:00	"	"		✓	✓		
6	WWE WTP D-1 Trough	"	15:45	"	"		✓	✓		
7	WWE WTP D-2	1.29.20	8:50	"	"		✓	✓		
8										
9										
10										

Matrix Codes*

S	Soil/Solid Sediment	SW	Surface Water
GW	Ground Water	SL	Sludge
WW	Waste Water	O	Other (Please Specify)
DW	Drinking Water		

Pres Codes

A-	none	I-	Ice
B-	HNO_3	O-	Other
C-	H_2SO_4	M-	MeOH
D-	NaOH	N -	$Na_2S_2O_3$
E-	HCl	Z-	ZnAc

Relinquished by	Date	Time	Received by	Date	Time
W. McK	1.29.20	15:30	[signature]	1/29/20	1620
[signature]	1/29/20	1900	FLX	1/29/20	1900
FLX	1/30/20	0830	[signature]	1/30/20	0830

QA/QC level with report
None ___1___2___3___ See price guide for applicable fees

FDEP Dry Cleaning ❑ FDEP UST Pre-Approval ❑
SFWMD ❑ ADaPT ❑ DOT ❑

Temp Control: 2.3 °C

Page_____of_____

2066569

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	2066569	**Profile:**	2938
Client:	GHD Tampa	**Project:**	J. Rogers
Level:	1	**Date Rec'd:**	1/30/2020 8:30:00 AM
Rec'd via:	courier		

Cooler Check

ID	Temp	# of samples	Security Tape Present	Security Tape Intact	Method of Receipt	Comments
	2.3	7	☐	☐		

Checked By: MD

Sample Verification

Loose Caps?	No	**All Samples on COC accounted For?**	Yes
Broken Containers?	No	**All Samples on COC?**	Yes
pH Verified?	No	**Written on Internal COC?**	No
pH Strip Lot #		**Sample Vol. Suff. For Analysis?**	Yes
Acid Preserved Samples Lot #		**Samples Rec'd W/I Hold Time?**	Yes
Base Preserved Samples Lot #		**Are All Samples to be Analyzed?**	Yes
Samples Received From	courier	**Correct Sample Containers?**	Yes
Soil Origin (Domestic/Foreign	Domestic	**COC Comments written on COC?**	No
Site Location/Project on COC?	Yes	**Samplers Initials on COC?**	Yes
Client Project # on COC?	Yes	**Sample Date/Time Indicated?**	Yes
Project Mgr. Indicated on COC	Yes	**TAT Requested:**	STD
COC relinquished/Dated by Client?	Yes	**Client Requests Verbal Results?**	No
COC Received/Dated by JEL	Yes	**Client Notified of discrepancies?**	No
JEL to Conduct ALL Analyses?	Yes	**Do VOC vials have headspace or a bubble <6mm (1/4")?**	N/A

Subcontract Analysis

Parameter	Via	Lab Name	Comments

EZ Profile™

Requested Facility: Okeechobee Landfill ❑ Unsure Profile Number: _____

❑ Multiple Generator Locations (Attach Locations) ☑ Request Certificate of Disposal ❑ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Lee County Utilities - Fort Myers Beach WWTP
2. Site Address: 17155 Pine Ridge Rd
   (City, State, ZIP) Fort Myers Beach, FL 33931
3. County: Lee County
4. Contact Name: _____
5. Email: _____
6. Phone: _____ 7. Fax: _____
8. Generator EPA ID: _____ ❑ N/A
9. State ID: _____ ❑ N/A

B. BILLING INFORMATION ❑ SAME AS GENERATOR

1. Billing Name: To be determined (bid contractor to Lee County)
2. Billing Address: _____
   (City, State, ZIP) _____
3. Contact Name: _____
4. Email: _____
5. Phone: _____ 6. Fax: _____
7. WM Hauled? ❑ Yes ☑ No
8. P.O. Number: _____
9. Payment Method: ❑ Credit Account ❑ Cash ❑ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Material from process tanks at decommissioned WWTP.
   Describe Process Generating Material: ❑ See Attached

   Non-contaminated sediments (e.g. sands/scale) remaining in process tank (i.e. chlorine contact towers at the Fort Myers Beach (FMB) municipal wastewater treatment plant (WWTP) that have been out-of-service/decommissioned for several years and is scheduled for demolition.

2. Material Composition and Contaminants: ❑ See Attached

1. Sediment - WWTP chlorine contact towers (ID D-8 & D-9)	100 %
2.	
3.	
4.	
Total comp. must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ❑ N/A
4. Color: Brown
5. Physical State at 70˚F: ☑ Solid ❑ Liquid ❑ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ❑ Yes ☑ No Describe: _____
9. Flash Point: ❑ <140˚F ❑ 140˚–199˚F ❑ ≥200˚ ☑ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ❑ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ❑ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ❑ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ❑ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ❑ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ❑ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ❑ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ❑ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ❑ Yes ☑ No
   a. Regulated by 40 CFR 761? ❑ Yes ❑ No
   b. Remediation under 40 CFR 761.61 (a)? ❑ Yes ❑ No
   c. Were PCB imported into the US? ❑ Yes ❑ No
10. Regulated and/or Untreated Medical/Infectious Waste? ❑ Yes ☑ No
11. Contains Asbestos? ❑ Yes ☑ No
    → If Yes: ❑ Non-Friable ❑ Non-Friable – Regulated ❑ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes
   Please identify applicable samples and/or lab reports:

   Sample ID is FMBWWTP D-9. Lab reports are AEL Report # F2000467 LCU PLANTS DEMO and Jupiter Report # 2066571.

2. Other information attached (such as MSDS)? ❑ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ❑ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: approx two (2) cubic yards
   ❑ Tons ☑ Yards ❑ Drums ❑ Gallons ❑ Other: _____
3. Container Type and Size: To be determined.
4. USDOT Proper Shipping Name: ☑ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): Jennifer L. Rogers Date: 3/6/2020

Title: Project Engineer

Company: GHD Services, Inc.

Certification Signature

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118
www.jupiterlabs.com
clientservices@jupiterlabs.com

February 10, 2020

Jennifer Rogers
GHD - Tampa
5904 Hampton Oaks Pkwy
Suite F
Tampa, FL

RE: LOG# 2066569
Project ID: LCU Plants Demo 11207790
COC# 2066569

Dear Jennifer Rogers:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, January 30, 2020. Results reported herein conform to the most current NELAC standards, where applicable, unless indicated by * in the body of the report. The enclosed Chain of Custody is a component of this package and should be retained with the package and incorporated therein.

Results for all solid matrices are reported in dry weight unless otherwise noted. Results for all liquid matrices are reported as received in the laboratory unless otherwise noted. Results relate only to the samples received. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

Samples are disposed of after 30 days of their receipt by the laboratory unless extended storage is requested in writing. The laboratory maintains the right to charge storage fees for archived samples. This report will be archived for 5 years after which time it will be destroyed without further notice, unless prior arrangements have been made.

Certain analyses are subcontracted to outside NELAC certified laboratories, please see the Project Summary section of this report for NELAC certification numbers of laboratories used. A Statement of Qualifiers is available upon request.

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

Sincerely,

John Heyman for
Kacia Baldwin
V.P. of Operations

FDOH# E86546

CERTIFICATE OF ANALYSIS

CASE NARRATIVE

Jupiter Environmental Laboratories Inc. Lab Reference No./SDG: 2066569

Client: GHD Tampa

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. METHODS

Samples were analyzed according to JEL's Standard Operating Procedures for following Method(s):
EPA 1311 (TCLP), EPA 8260C (TCLP), EPA 8270C (TCLP), SM 2540G

III. Analysis

Sample analysis proceeded normally with the exception of following:

Exceptions:

Method: EPA 8270C (TCLP)

Flag: J2|Surrogate recovery was outside defined limits due to matrix interference.
Following Samples/Analytes were flagged:

- LabID: 2066569001; SampleID: SCWWTP D-4
  Analytes: Nitrobenzene-d5

- LabID: 2066569002; SampleID: SCWWTP D-2/2.5'
  Analytes: 2,4,6-Tribromophenol; 2-Fluorobiphenyl; 2-Fluorophenol; Nitrobenzene-d5; Phenol-d5; p-Terphenyl-d14

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Jupiter Environmental Laboratories, Inc., both technically and for completeness, for other than the conditions detailed in the SDG Narrative. Release of the data contained in this hardcopy data package and in the electronic data submitted has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

SIGNED: DATE: 2/10/20

John Heyman for
Kacia Baldwin
V.P. of Operations

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

SAMPLE ANALYTE COUNT

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	Method	Analytes Reported
2066569001	SCWWTP D-4	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569002	SCWWTP D-2/2.5'	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569003	SCWWTP D-3/2.5'	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569004	WWE WTP D-9	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569005	WWE WTP D-1 Deep	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569006	WWE WTP D-1 Trough	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569007	WWE WTP D-2	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

SAMPLE SUMMARY

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2066569001	SCWWTP D-4	Soil/Solid	1/28/2020 10:30	1/30/2020 08:30
2066569002	SCWWTP D-2/2.5'	Soil/Solid	1/28/2020 12:15	1/30/2020 08:30
2066569003	SCWWTP D-3/2.5'	Soil/Solid	1/28/2020 12:40	1/30/2020 08:30
2066569004	WWE WTP D-9	Soil/Solid	1/28/2020 15:10	1/30/2020 08:30
2066569005	WWE WTP D-1 Deep	Soil/Solid	1/28/2020 16:00	1/30/2020 08:30
2066569006	WWE WTP D-1 Trough	Soil/Solid	1/28/2020 15:45	1/30/2020 08:30
2066569007	WWE WTP D-2	Soil/Solid	1/29/2020 08:50	1/30/2020 08:30

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569004** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-9** Date Collected: 1/28/2020 15:10

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Dibromofluoromethane (S)	95	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Toluene d8 (S)	100	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
4-Bromofluorobenzene (S)	97	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:16	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2-Fluorophenol (S)	56	%	20-110		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Phenol-d5 (S)	38	%	10-110		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Nitrobenzene-d5 (S)	109	%	30-110		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2-Fluorobiphenyl (S)	78	%	40-110		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
2,4,6-Tribromophenol (S)	74	%	10-120		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
p-Terphenyl-d14 (S)	92	%	30-140		1	2/5/2020 10:09	LAL	2/6/2020 23:37	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569004** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-9** Date Collected: 1/28/2020 15:10

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	40.6	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

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Jupiter, FL 33458
Phone: (561)575-0030
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ANALYTICAL RESULTS QUALIFIERS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

PARAMETER QUALIFIERS

J2	Surrogate recovery was outside defined limits due to matrix interference.

PROJECT COMMENTS

2066569	A reported value of U indicates that the compound was analyzed for but not detected above the MDL. A value flagged with an "i" flag indicates that the reported value is between the laboratory method detection limit and the practical quantitation limit.

FDOH# E86546

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Phone: (561)575-0030
Fax: (561)575-4118

QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

QC Batch: XXX/13211 Analysis Method: EPA 8270C (TCLP)

QC Batch Method: EPA 3510C

Associated Lab Samples: 2066569001, 2066569002, 2066569003, 2066569004, 2066569005, 2066569006, 2066569007, 2066570001, 2066570002, 2066570003, 2066570004, 2066570005, 2066570006, 2066570007, 2066570008, 2066647001, 2066647002

METHOD BLANK: 187663

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Semivolatiles by EPA 8270C				
2-Fluorophenol (S)	%	49	20-110	
Phenol-d5 (S)	%	34	10-110	
Nitrobenzene-d5 (S)	%	105	30-110	
2-Fluorobiphenyl (S)	%	81	40-110	
2,4,6-Tribromophenol (S)	%	80	10-120	
p-Terphenyl-d14 (S)	%	95	30-140	
Pyridine	ug/L	U	2.44	
1,4-Dichlorobenzene	ug/L	U	1.59	
2-Methylphenol	ug/L	U	1.73	
Hexachloroethane	ug/L	U	0.950	
Nitrobenzene	ug/L	U	1.49	
Hexachlorobutadiene	ug/L	U	3.85	
2,4,6-Trichlorophenol	ug/L	U	0.200	
2,4,5-Trichlorophenol	ug/L	U	0.280	
2,4-Dinitrotoluene	ug/L	U	1.54	
Hexachlorobenzene	ug/L	U	1.94	
Pentachlorophenol	ug/L	U	1.58	
3&4-Methylphenol	ug/L	U	1.24	

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Semivolatiles by EPA 8270C				
2-Fluorophenol (S)	%	56	20-110	
Phenol-d5 (S)	%	40	10-110	
Nitrobenzene-d5 (S)	%	115	30-110	
2-Fluorobiphenyl (S)	%	79	40-110	
2,4,6-Tribromophenol (S)	%	82	10-120	
p-Terphenyl-d14 (S)	%	94	30-140	
Pyridine	ug/L	U	2.44	
1,4-Dichlorobenzene	ug/L	U	1.59	
2-Methylphenol	ug/L	U	1.73	
Hexachloroethane	ug/L	U	0.950	
Nitrobenzene	ug/L	U	1.49	
Hexachlorobutadiene	ug/L	U	3.85	
2,4,6-Trichlorophenol	ug/L	U	0.200	
2,4,5-Trichlorophenol	ug/L	U	0.280	
2,4-Dinitrotoluene	ug/L	U	1.54	

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

METHOD BLANK: 187663

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Hexachlorobenzene	ug/L	U	1.94	
Pentachlorophenol	ug/L	U	1.58	
3&4-Methylphenol	ug/L	U	1.24	

LABORATORY CONTROL SAMPLE & LCSD: 187664 187665

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Semivolatiles by EPA 8270C										
2-Fluorophenol (S)	%				45	45	20-110	0	40	
Phenol-d5 (S)	%				32	33	10-110	0	40	
Nitrobenzene-d5 (S)	%				110	105	30-110	5	40	
2-Fluorobiphenyl (S)	%				79	79	40-110	3	40	
2,4,6-Tribromophenol (S)	%				86	82	10-120	3	40	
p-Terphenyl-d14 (S)	%				91	95	30-140	3	40	
Pyridine	ug/L		U	U				0	40	
1,4-Dichlorobenzene	ug/L	25.2	13.0	14.9	52	59	20-100	14	40	
2-Methylphenol	ug/L		U	U				0	40	
Hexachloroethane	ug/L		U	U				0	40	
Nitrobenzene	ug/L		U	U				0	40	
Hexachlorobutadiene	ug/L		U	U				0	40	
2,4,6-Trichlorophenol	ug/L		U	U				0	40	
2,4,5-Trichlorophenol	ug/L		U	U				0	40	
2,4-Dinitrotoluene	ug/L	25.2	18.9	18.3	75	73	30-140	3	40	
Hexachlorobenzene	ug/L		U	U				0	40	
Pentachlorophenol	ug/L	49.6	40.9	39.1	83	79	20-120	5	40	
3&4-Methylphenol	ug/L		U	U				0	40	

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
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Jupiter, FL 33458
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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

QC Batch: VXX/9364 Analysis Method: EPA 8260C (TCLP)

QC Batch Method: EPA 5030B

Associated Lab Samples: 2066569001 2066569002 2066569003 2066569004 2066569005 2066569006 2066569007

METHOD BLANK: 187951

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Volatiles by GC/MS				
Dibromofluoromethane (S)	%	94	70-130	
Toluene d8 (S)	%	95	70-130	
4-Bromofluorobenzene (S)	%	93	70-130	
Vinyl chloride	ug/L	U	0.400	
1,1-Dichloroethene	ug/L	U	0.400	
Methyl ethyl ketone (MEK)	ug/L	U	0.640	
Chloroform	ug/L	U	0.400	
1,2-Dichloroethane	ug/L	U	0.400	
Carbon tetrachloride	ug/L	U	0.400	
Benzene	ug/L	U	0.400	
Trichloroethene	ug/L	U	0.400	
Tetrachloroethene	ug/L	U	0.400	
Chlorobenzene	ug/L	U	0.400	
1,4-Dichlorobenzene	ug/L	U	0.400	

LABORATORY CONTROL SAMPLE & LCSD: 187952 187953

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Volatiles by GC/MS										
Dibromofluoromethane (S)	%				96	101	70-130	5	75	
Toluene d8 (S)	%				97	98	70-130	0.3	75	
4-Bromofluorobenzene (S)	%				91	93	70-130	1	75	
Vinyl chloride	ug/L	49.8	42.6	41.2	86	83	70-135	3	75	
1,1-Dichloroethene	ug/L	49.5	43.8	43.9	88	89	70-135	0.2	75	
Methyl ethyl ketone (MEK)	ug/L	50.2	47.0	42.4	94	85	70-135	10	75	
Chloroform	ug/L	49.7	46.4	46.6	93	94	70-135	0.4	75	
1,2-Dichloroethane	ug/L	49.9	44.3	44.4	89	89	70-135	0.2	75	
Carbon tetrachloride	ug/L	50.3	48.6	49.3	97	98	70-135	1	75	
Benzene	ug/L	49.7	45.9	46.8	92	94	70-135	2	75	
Trichloroethene	ug/L	50	47.0	48.1	94	96	70-135	2	75	
Tetrachloroethene	ug/L	49.9	52.1	51.3	104	103	70-135	2	75	
Chlorobenzene	ug/L	49.9	51.6	51.6	103	103	70-135	0	75	
1,4-Dichlorobenzene	ug/L	50.5	46.3	45.9	92	91	70-135	0.9	75	

FDOH# E86546

CERTIFICATE OF ANALYSIS

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

LABORATORY CONTROL SAMPLE & LCSD: 187954 187955

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Dibromofluoromethane (S)	%				95	96	70-130	1	75	
Toluene d8 (S)	%				95	97	70-130	1	75	
4-Bromofluorobenzene (S)	%				94	96	70-130	1	75	

SAMPLE DUPLICATE: 187956 Original: 2066665005

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Volatiles by GC/MS						
Dibromofluoromethane (S)	%	38.3		3	75	
Toluene d8 (S)	%	37.3		2	75	
4-Bromofluorobenzene (S)	%	37.3		4	75	
Vinyl chloride	ug/L	0	U	0	75	
1,1-Dichloroethene	ug/L	0	U	0	75	
Methyl ethyl ketone (MEK)	ug/L		U			
Chloroform	ug/L	0	U	0	75	
1,2-Dichloroethane	ug/L	0	U	0	75	
Carbon tetrachloride	ug/L	0	U	0	75	
Benzene	ug/L	0	U	0	75	
Trichloroethene	ug/L	0	U	0	75	
Tetrachloroethene	ug/L	0	U	0	75	
Chlorobenzene	ug/L	0	U	0	75	
1,4-Dichlorobenzene	ug/L	0	U	0	75	

SAMPLE DUPLICATE: 187957 Original: 2066667001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Volatiles by GC/MS						
Dibromofluoromethane (S)	%	38.3		0.8	75	
Toluene d8 (S)	%	38.4		0.5	75	
4-Bromofluorobenzene (S)	%	36.6		1	75	
Vinyl chloride	ug/L	0	U	0	75	
1,1-Dichloroethene	ug/L	0	U	0	75	
Methyl ethyl ketone (MEK)	ug/L	0	U	0	75	
Chloroform	ug/L	0	U	0	75	
1,2-Dichloroethane	ug/L	0	U	0	75	
Carbon tetrachloride	ug/L	0	U	0	75	
Benzene	ug/L	0	U	0	75	
Trichloroethene	ug/L	0	U	0	75	
Tetrachloroethene	ug/L	0	U	0	75	

FDOH# E86546

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

SAMPLE DUPLICATE: 187957 Original: 2066667001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Chlorobenzene	ug/L	0	U	0	75	
1,4-Dichlorobenzene	ug/L	0	U	0	75	

FDOH# E86546

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2066569001	**SCWWTP D-4**	SM 2540G	WGR/4296		
2066569002	**SCWWTP D-2/2.5'**	SM 2540G	WGR/4296		
2066569003	**SCWWTP D-3/2.5'**	SM 2540G	WGR/4296		
2066569004	**WWE WTP D-9**	SM 2540G	WGR/4296		
2066569005	**WWE WTP D-1 Deep**	SM 2540G	WGR/4296		
2066569006	**WWE WTP D-1 Trough**	SM 2540G	WGR/4296		
2066569007	**WWE WTP D-2**	SM 2540G	WGR/4296		
2066569001	**SCWWTP D-4**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6906
2066569002	**SCWWTP D-2/2.5'**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6906
2066569003	**SCWWTP D-3/2.5'**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569004	**WWE WTP D-9**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569005	**WWE WTP D-1 Deep**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569006	**WWE WTP D-1 Trough**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569007	**WWE WTP D-2**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569001	**SCWWTP D-4**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569002	**SCWWTP D-2/2.5'**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569003	**SCWWTP D-3/2.5'**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569004	**WWE WTP D-9**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569005	**WWE WTP D-1 Deep**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569006	**WWE WTP D-1 Trough**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569007	**WWE WTP D-2**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter
Environmental Laboratories, Inc.

www.jupiterlabs.com
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(561) 575-0030 • (888) 287-3218 • clientservices@jupiterlabs.com

J.E.L. Log # 2066569
P.O. # _____
Quote # _____

Company Name GHD
Address 5904 Hampton Oak Pkwy
City Tampa State FL Zip
Sampling Site Address
Attn: Jennifer Rogers Email
Project Name LCU Plants Demo Project # 11207790
Sampler Name/Signature W. McKinney

LAB ANALYSIS

Requested Turnaround Time
Note: Rush requests subject to acceptance by the laboratory
X Standard
___ Expedited
Due___/___/___

#	Sample Label (Client ID)	Collected Date	Collected Time	Matrix Code*	# of Cont	Pres Codes	Parameters: TCLP VOC's Full List	Parameters: TCLP SVOC's	Field Filtered (Y/N)	Comments
1	SCWWTP D-4	1.28.20	10:30	SO	2		✓	✓		
2	SCWWTP D-2/2.5'	"	12:15	"	"		✓	✓		
3	SCWWTP D-3/2.5'	"	12:40	"	"		✓	✓		
4	WWE WTP D-9	"	15:10	"	"		✓	✓		
5	WWE WTP D-1 Deep	"	16:00	"	"		✓	✓		
6	WWE WTP D-1 Trough	"	15:45	"	"		✓	✓		
7	WWE WTP D-2	1.29.20	8:50	"	"		✓	✓		
8										
9										
10										

Matrix Codes*

S	Soil/Solid Sediment	SW	Surface Water
GW	Ground Water	SL	Sludge
WW	Waste Water	O	Other (Please Specify)
DW	Drinking Water		

Pres Codes

A-	none	I-	Ice
B-	HNO_3	O-	Other
C-	H_2SO_4	M-	MeOH
D-	NaOH	N -	$Na_2S_2O_3$
E-	HCl	Z-	ZnAc

Relinquished by	Date	Time	Received by	Date	Time
W. McK	1.29.20	15:30	[signature]	1/29/20	1620
[signature]	1/29/20	1900	FLX	1/29/20	1900
FLX	1/30/20	0830	[signature]	1/30/20	0830

QA/QC level with report
None ___1___2___3___ See price guide for applicable fees

FDEP Dry Cleaning ❑ FDEP UST Pre-Approval ❑
SFWMD ❑ ADaPT ❑ DOT ❑

Temp Control: 2.3 °C

Page_____of_____

2066569

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	2066569	**Profile:**	2938
Client:	GHD Tampa	**Project:**	J. Rogers
Level:	1	**Date Rec'd:**	1/30/2020 8:30:00 AM
Rec'd via:	courier		

Cooler Check

ID	Temp	# of samples	Security Tape Present	Security Tape Intact	Method of Receipt	Comments
	2.3	7	☐	☐		

Checked By: MD

Sample Verification

Loose Caps?	No	**All Samples on COC accounted For?**	Yes
Broken Containers?	No	**All Samples on COC?**	Yes
pH Verified?	No	**Written on Internal COC?**	No
pH Strip Lot #		**Sample Vol. Suff. For Analysis?**	Yes
Acid Preserved Samples Lot #		**Samples Rec'd W/I Hold Time?**	Yes
Base Preserved Samples Lot #		**Are All Samples to be Analyzed?**	Yes
Samples Received From	courier	**Correct Sample Containers?**	Yes
Soil Origin (Domestic/Foreign	Domestic	**COC Comments written on COC?**	No
Site Location/Project on COC?	Yes	**Samplers Initials on COC?**	Yes
Client Project # on COC?	Yes	**Sample Date/Time Indicated?**	Yes
Project Mgr. Indicated on COC	Yes	**TAT Requested:**	STD
COC relinquished/Dated by Client?	Yes	**Client Requests Verbal Results?**	No
COC Received/Dated by JEL	Yes	**Client Notified of discrepancies?**	No
JEL to Conduct ALL Analyses?	Yes	**Do VOC vials have headspace or a bubble <6mm (1/4")?**	N/A

Subcontract Analysis

Parameter	Via	Lab Name	Comments

Advanced Environmental Laboratories, Inc.

Advanced Environmental Laboratories, Inc
13100 Westlinks Terrace, Unit 10 Ft. Myers FL 33913
Payments: P.O. Box 551580Jacksonville, FL 32255-1580
Phone: (239) 674-8130
Fax: (239) 674-8128

February 11, 2020

Jennifer L. Rogers
GHD
2675 Winkler Ave, Suite 180
Fort Myers, FL 33901

RE: Workorder: F2000467 LCU PLANTS DEMO

Dear Jennifer Rogers:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, January 29, 2020. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

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

Sincerely,

Josh Snead - Laboratory Manager
JSnead@aellab.com

Enclosures

CERTIFICATE OF ANALYSIS

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Phone: (239) 674-8130
Fax: (239) 674-8128

SAMPLE SUMMARY

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Matrix	Date Collected	Date Received
F2000467001	FMBWWTP D6U	Soil	1/27/2020 09:40	1/29/2020 13:10
F2000467002	FMBWWTP D6L	Soil	1/27/2020 09:50	1/29/2020 13:10
F2000467003	FMBWWTP D5U	Soil	1/27/2020 10:20	1/29/2020 13:10
F2000467004	FMBWWTP D5L	Soil	1/27/2020 10:30	1/29/2020 13:10
F2000467005	FMBWWTP D4U	Soil	1/27/2020 11:20	1/29/2020 13:10
F2000467006	FMBWWTP D4L	Soil	1/27/2020 11:30	1/29/2020 13:10
F2000467007	FMBWWTP D3U	Soil	1/27/2020 12:15	1/29/2020 13:10
F2000467008	FMBWWTP D3L	Soil	1/27/2020 12:25	1/29/2020 13:10
F2000467009	FMBWWTP D2U	Soil	1/27/2020 13:15	1/29/2020 13:10
F2000467010	FMBWWTP D2L	Soil	1/27/2020 13:25	1/29/2020 13:10
F2000467011	FMBWWTP D9	Soil	1/27/2020 14:00	1/29/2020 13:10
F2000467012	SCWWTP-D-4	Soil	1/28/2020 10:30	1/29/2020 13:10
F2000467013	SCWWTP-D-2/2.5FT	Soil	1/28/2020 12:15	1/29/2020 13:10
F2000467014	SCWWTP-D-3 / 2.5FT	Soil	1/28/2020 12:40	1/29/2020 13:10
F2000467015	WWEWTP D-9	Soil	1/28/2020 15:10	1/29/2020 13:10
F2000467016	WWEWTP D-1 DEEP	Soil	1/28/2020 16:00	1/29/2020 13:10
F2000467017	WWEWTP D-1 TROUGH	Soil	1/28/2020 15:45	1/29/2020 13:10
F2000467018	WWEWTP D-2	Soil	1/29/2020 08:50	1/29/2020 13:10

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467010** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D2L** Date Collected: 01/27/20 13:25

Results for sample F2000467010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
1,2-Dichloroethane-d4 (S)	**124**		**%**	**10**	69-134		2/5/2020 22:10	
Toluene-d8 (S)	**108**		**%**	**10**	72-122		2/5/2020 22:10	
Bromofluorobenzene (S)	**116**		**%**	**10**	79-126		2/5/2020 22:10	
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**91**		**mg/Kg**	**1**	11	1.4	1/30/2020 15:09	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**12**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467011** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D9** Date Collected: 01/27/20 14:00

Results for sample F2000467011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/3/2020 22:18	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/3/2020 22:18	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/3/2020 22:18	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/3/2020 22:18	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/3/2020 22:18	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/3/2020 22:18	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/3/2020 22:18	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/3/2020 22:18	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/3/2020 15:17	T
VOLATILES, TCLP								

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467011** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D9** Date Collected: 01/27/20 14:00

Results for sample F2000467011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 1311/8260B Analysis, TCLP	Preparation Method: SW-846 5030B Analytical Method: SW-846 8260B							
1,1,1,2-Tetrachloroethane	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 22:36	T
1,1,1-Trichloroethane	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 22:36	T
1,1,2,2-Tetrachloroethane	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:36	T
1,1,2-Trichloroethane	**4.6**	**U**	**ug/L**	**10**	10	4.6	2/5/2020 22:36	T
1,1-Dichloroethane	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 22:36	T
1,1-Dichloroethylene	**7.0**	**U**	**ug/L**	**10**	10	7.0	2/5/2020 22:36	T
1,1-Dichloropropene	**3.9**	**U**	**ug/L**	**10**	10	3.9	2/5/2020 22:36	T
1,2,3-Trichlorobenzene	**8.6**	**U**	**ug/L**	**10**	10	8.6	2/5/2020 22:36	T
1,2,3-Trichloropropane	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 22:36	T
1,2,4-Trichlorobenzene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 22:36	T
1,2,4-Trimethylbenzene	**5.4**	**U**	**ug/L**	**10**	10	5.4	2/5/2020 22:36	T
1,2-Dibromo-3-Chloropropane	**23**	**U**	**ug/L**	**10**	30	23	2/5/2020 22:36	T
1,2-Dichlorobenzene	**6.3**	**U**	**ug/L**	**10**	10	6.3	2/5/2020 22:36	T
1,2-Dichloroethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:36	T
1,2-Dichloropropane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 22:36	T
1,3,5-Trimethylbenzene	**6.8**	**U**	**ug/L**	**10**	10	6.8	2/5/2020 22:36	T
1,3-Dichlorobenzene	**4.3**	**U**	**ug/L**	**10**	10	4.3	2/5/2020 22:36	T
1,3-Dichloropropane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 22:36	T
1,4-Dichlorobenzene	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 22:36	T
2,2-Dichloropropane	**8.2**	**U**	**ug/L**	**10**	10	8.2	2/5/2020 22:36	T
2-Butanone (MEK)	**5.9**	**U**	**ug/L**	**10**	10	5.9	2/5/2020 22:36	T
2-Chloroethyl Vinyl Ether	**5.8**	**U**	**ug/L**	**10**	10	5.8	2/5/2020 22:36	T
2-Chlorotoluene	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 22:36	T
2-Hexanone	**9.9**	**U**	**ug/L**	**10**	10	9.9	2/5/2020 22:36	T
4-Chlorotoluene	**4.4**	**U**	**ug/L**	**10**	10	4.4	2/5/2020 22:36	T
4-Methyl-2-pentanone (MIBK)	**9.3**	**U**	**ug/L**	**10**	10	9.3	2/5/2020 22:36	T
Acetone	**34**		**ug/L**	**10**	20	10	2/5/2020 22:36	T
Acrolein (Propenal)	**35**	**U**	**ug/L**	**10**	40	35	2/5/2020 22:36	T
Acrylonitrile	**19**	**U**	**ug/L**	**10**	50	19	2/5/2020 22:36	T
Benzene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:36	T
Bromobenzene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 22:36	T
Bromochloromethane	**3.3**	**U**	**ug/L**	**10**	10	3.3	2/5/2020 22:36	T
Bromodichloromethane	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:36	T
Bromoform	**8.8**	**U**	**ug/L**	**10**	10	8.8	2/5/2020 22:36	T
Bromomethane	**9.7**	**U**	**ug/L**	**10**	10	9.7	2/5/2020 22:36	T
Carbon Disulfide	**4.9**	**U**	**ug/L**	**10**	10	4.9	2/5/2020 22:36	T
Carbon Tetrachloride	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:36	T

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467011** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D9** Date Collected: 01/27/20 14:00

Results for sample F2000467011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Chlorobenzene	**5.6**	**U**	**ug/L**	**10**	10	5.6	2/5/2020 22:36	T
Chloroethane	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 22:36	T
Chloroform	**3.1**	**U**	**ug/L**	**10**	10	3.1	2/5/2020 22:36	T
Chloromethane	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 22:36	T
Dibromochloromethane	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 22:36	T
Dibromomethane	**7.6**	**U**	**ug/L**	**10**	10	7.6	2/5/2020 22:36	T
Dichlorodifluoromethane	**3.6**	**U**	**ug/L**	**10**	10	3.6	2/5/2020 22:36	T
Ethylbenzene	**2.6**	**U**	**ug/L**	**10**	10	2.6	2/5/2020 22:36	T
Ethylene Dibromide (EDB)	**6.7**	**U**	**ug/L**	**10**	10	6.7	2/5/2020 22:36	T
Hexachlorobutadiene	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 22:36	T
Iodomethane (Methyl Iodide)	**6.5**	**U**	**ug/L**	**10**	10	6.5	2/5/2020 22:36	T
Isopropylbenzene	**8.0**	**U**	**ug/L**	**10**	10	8.0	2/5/2020 22:36	T
Methyl tert-butyl Ether (MTBE)	**4.1**	**U**	**ug/L**	**10**	10	4.1	2/5/2020 22:36	T
Methylene Chloride	**11**	**V**	**ug/L**	**10**	10	10	2/5/2020 22:36	T
Naphthalene	**7.3**	**U**	**ug/L**	**10**	10	7.3	2/5/2020 22:36	T
Styrene	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 22:36	T
Tetrachloroethylene (PCE)	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:36	T
Toluene	**4.5**	**U**	**ug/L**	**10**	10	4.5	2/5/2020 22:36	T
Trichloroethene	**6.0**	**U**	**ug/L**	**10**	10	6.0	2/5/2020 22:36	T
Trichlorofluoromethane	**8.4**	**U**	**ug/L**	**10**	10	8.4	2/5/2020 22:36	T
Vinyl Acetate	**4.0**	**U**	**ug/L**	**10**	10	4.0	2/5/2020 22:36	T
Vinyl Chloride	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:36	T
Xylene (Total)	**5.6**	**U**	**ug/L**	**10**	30	5.6	2/5/2020 22:36	T
cis-1,2-Dichloroethylene	**5.1**	**U**	**ug/L**	**10**	10	5.1	2/5/2020 22:36	T
cis-1,3-Dichloropropene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:36	T
n-Butylbenzene	**6.4**	**U**	**ug/L**	**10**	10	6.4	2/5/2020 22:36	T
n-propylbenzene	**4.8**	**U**	**ug/L**	**10**	10	4.8	2/5/2020 22:36	T
sec-butylbenzene	**3.8**	**U**	**ug/L**	**10**	10	3.8	2/5/2020 22:36	T
tert-butylbenzene	**5.3**	**U**	**ug/L**	**10**	10	5.3	2/5/2020 22:36	T
trans-1,2-Dichloroethylene	**5.0**	**U**	**ug/L**	**10**	10	5.0	2/5/2020 22:36	T
trans-1,3-Dichloropropylene	**2.0**	**U**	**ug/L**	**10**	10	2.0	2/5/2020 22:36	T
1,2-Dichloroethane-d4 (S)	**132**		**%**	**10**	69-134		2/5/2020 22:36	
Toluene-d8 (S)	**106**		**%**	**10**	72-122		2/5/2020 22:36	
Bromofluorobenzene (S)	**111**		**%**	**10**	79-126		2/5/2020 22:36	

WET CHEMISTRY

Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**990**		**mg/Kg**	**1**	10	1.3	1/30/2020 15:21	F

WET CHEMISTRY

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467011** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **FMBWWTP D9** Date Collected: 01/27/20 14:00

Results for sample F2000467011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**5.7**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467012** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **SCWWTP-D-4** Date Collected: 01/28/20 10:30

Results for sample F2000467012 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	2/3/2020 22:22	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	2/3/2020 22:22	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	2/3/2020 22:22	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	2/3/2020 22:22	T
Copper	**0.014**	**U**	**mg/L**	**1**	0.080	0.014	2/3/2020 22:22	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	2/3/2020 22:22	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	2/3/2020 22:22	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	2/3/2020 22:22	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/3/2020 15:20	T
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**51**		**mg/Kg**	**1**	9.4	1.2	1/30/2020 15:58	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**0.13**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

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ANALYTICAL RESULTS QUALIFIERS

Workorder: F2000467 LCU PLANTS DEMO

PARAMETER QUALIFIERS

U	The compound was analyzed for but not detected.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
V	Method Blank Contamination
J4	Estimated Result

LAB QUALIFIERS

F	DOH Certification #E84492(AEL-F)(FL NELAC Certification)
T	DOH Certification #E84589(AEL-T)(FL NELAC Certification)

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: WCAf/1070 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006, F2000467007,

METHOD BLANK: 3366452

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Sulfate	mg/Kg	1.3	1.3	U

LABORATORY CONTROL SAMPLE: 3366453

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
WET CHEMISTRY						
Sulfate	mg/Kg	49	48	99	90-110	

QC Batch: WCAf/1071 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: F2000467011, F2000467012, F2000467013, F2000467014, F2000467015, F2000467016, F2000467017, F2000467018

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3366456 3366457 Original: F2000467011

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
WET CHEMISTRY											
Sulfate	mg/Kg	930	470	1500	1500	102	102	90-110	0	10	

QC Batch: DGMt/1143 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 01/31/2020 10:00
Associated Lab Samples: F2000467015, F2000467018

METHOD BLANK: 3368232

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3368232

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

LABORATORY CONTROL SAMPLE: 3368233

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.8	95	80-120	
Arsenic	mg/L	4	3.8	94	80-120	
Barium	mg/L	4	3.9	96	80-120	
Cadmium	mg/L	4	3.7	92	80-120	
Chromium	mg/L	4	3.8	96	80-120	
Copper	mg/L	4	4.0	100	80-120	
Lead	mg/L	4	3.5	88	80-120	
Selenium	mg/L	4	3.6	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368234 3368235 Original: T2002009001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0	4	3.7	3.7	92	93	75-125	1	20	
Arsenic	mg/L	0	4	3.8	3.8	95	95	75-125	0	20	
Barium	mg/L	0.27	4	3.9	3.8	96	96	75-125	0	20	
Cadmium	mg/L	5e-005	4	3.5	3.5	87	87	75-125	0	20	
Chromium	mg/L	0.017	4	3.7	3.7	93	93	75-125	0	20	
Copper	mg/L	0	4	3.9	3.9	97	97	75-125	0	20	
Lead	mg/L	0	4	3.3	3.3	84	84	75-125	0	20	
Selenium	mg/L	0.066	4	3.7	3.6	92	90	75-125	2	20	

QC Batch: DGMt/1144 Analysis Method: SW-846 6010

QC Batch Method: SW-846 3010A Prepared: 01/31/2020 10:00

Associated Lab Samples: F2000467013, F2000467014, F2000467016, F2000467017

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3368297

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Copper	mg/L	0.014	0.014	U

LABORATORY CONTROL SAMPLE: 3368298

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	4.4	111	80-120	
Arsenic	mg/L	4	4.6	116	80-120	
Barium	mg/L	4	4.3	109	80-120	
Cadmium	mg/L	4	4.4	111	80-120	
Chromium	mg/L	4	4.4	111	80-120	
Copper	mg/L	4	4.7	118	80-120	
Lead	mg/L	4	4.2	105	80-120	
Selenium	mg/L	4	4.5	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368299 3368300 Original: F2000467017

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.0014	4	4.3	4.0	107	100	75-125	7	20	
Arsenic	mg/L	0	4	4.4	4.1	111	103	75-125	7	20	
Barium	mg/L	0.38	4	4.4	4.1	110	103	75-125	7	20	
Cadmium	mg/L	0	4	4.2	3.8	105	96	75-125	8	20	
Chromium	mg/L	0.0026	4	4.2	3.9	105	99	75-125	7	20	
Copper	mg/L	0.049	4	4.6	4.3	113	105	75-125	7	20	
Lead	mg/L	0	4	3.9	3.7	98	91	75-125	7	20	
Selenium	mg/L	0	4	4.3	4.0	107	99	75-125	8	20	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: DGMt/1147 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 01/31/2020 11:00
Associated Lab Samples: F2000467015, F2000467018

METHOD BLANK: 3368654

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3368655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0051	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368656 3368657 Original: T2002009001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0.00022	0.005	0.0054	0.0054	108	107	80-120	0	20	

QC Batch: DGMt/1154 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 02/03/2020 10:00
Associated Lab Samples: F2000467007, F2000467008, F2000467009, F2000467010, F2000467011, F2000467012

METHOD BLANK: 3369710

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE: 3369711

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.4	86	80-120	
Arsenic	mg/L	4	3.5	87	80-120	
Barium	mg/L	4	3.5	88	80-120	
Cadmium	mg/L	4	3.4	85	80-120	
Chromium	mg/L	4	3.5	86	80-120	
Copper	mg/L	4	3.8	95	80-120	
Selenium	mg/L	4	3.3	83	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3369712 3369713 Original: F2000467007

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.0036	4	3.7	3.7	92	93	75-125	1	20	
Arsenic	mg/L	0	4	3.8	3.8	94	95	75-125	1	20	
Barium	mg/L	0.22	4	3.9	3.9	97	98	75-125	1	20	
Cadmium	mg/L	0	4	3.7	3.8	93	94	75-125	1	20	
Chromium	mg/L	0.0028	4	3.7	3.7	92	93	75-125	1	20	
Copper	mg/L	0.02	4	4.0	4.1	100	101	75-125	1	20	
Lead	mg/L	0	4	3.4	3.4	86	86	75-125	0	20	
Selenium	mg/L	0	4	3.6	3.6	89	91	75-125	2	20	

QC Batch: DGMt/1156 Analysis Method: SW-846 7470A

QC Batch Method: SW-846 7470A Prepared: 02/03/2020 11:00

Associated Lab Samples: F2000467013, F2000467014, F2000467016, F2000467017

METHOD BLANK: 3370208

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3370209

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0054	107	80-120	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3370210 3370211 Original: F2000467013

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0	0.005	0.0050	0.0050	101	99	80-120	2	20	

QC Batch: DGMt/1157 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 02/03/2020 11:00
Associated Lab Samples: F2000467007, F2000467008, F2000467009, F2000467010, F2000467011, F2000467012

METHOD BLANK: 3370217

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3370218

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0051	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3370219 3370220 Original: F2000467007

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0.00052	0.005	0.0054	0.0058	99	106	80-120	7	20	

QC Batch: DGMt/1166 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 02/04/2020 10:00
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3371104

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

LABORATORY CONTROL SAMPLE: 3371105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.2	81	80-120	
Arsenic	mg/L	4	3.7	91	80-120	
Barium	mg/L	4	3.4	85	80-120	
Cadmium	mg/L	4	3.5	86	80-120	
Chromium	mg/L	4	3.4	86	80-120	
Copper	mg/L	4	3.6	89	80-120	
Selenium	mg/L	4	3.6	91	80-120	

LABORATORY CONTROL SAMPLE: 3371105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	mg/L	4	3.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3371106 3371107 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.012	4	2.9	2.9	72	71	75-125	1	20	
Arsenic	mg/L	0	4	3.3	3.3	82	82	75-125	0	20	
Barium	mg/L	0.22	4	3.2	3.2	79	79	75-125	0	20	
Cadmium	mg/L	0	4	3.1	3.0	76	76	75-125	0	20	
Chromium	mg/L	0.0037	4	3.0	3.0	76	76	75-125	0	20	
Copper	mg/L	0.012	4	3.2	3.2	79	79	75-125	0	20	
Lead	mg/L	0	4	2.7	2.7	69	68	75-125	0	20	
Selenium	mg/L	0	4	3.2	3.1	80	78	75-125	2	20	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: DGMt/1171 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 02/04/2020 10:00
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006

METHOD BLANK: 3371652

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3371653

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0047	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3371654 3371655 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0	0.005	0.0049	0.0045	97	91	80-120	7	20	

QC Batch: MSVt/1208 Analysis Method: SW-846 8260B
QC Batch Method: SW-846 5030B Prepared: 02/05/2020 15:04
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006, F2000467007,

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Dichlorodifluoromethane	ug/L	0.36	0.36	U
Chloromethane	ug/L	0.53	0.53	U
Vinyl Chloride	ug/L	0.20	0.20	U
Bromomethane	ug/L	0.97	0.97	U
Chloroethane	ug/L	0.38	0.38	U
Trichlorofluoromethane	ug/L	0.84	0.84	U
Acrolein (Propenal)	ug/L	3.5	3.5	U
Acetone	ug/L	1.0	1.0	U
1,1-Dichloroethylene	ug/L	0.70	0.70	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Iodomethane (Methyl Iodide)	ug/L	0.65	0.65	U
Acrylonitrile	ug/L	1.9	1.9	U
Methylene Chloride	ug/L	4.0	1.0	
Carbon Disulfide	ug/L	0.49	0.49	U
trans-1,2-Dichloroethylene	ug/L	0.50	0.50	U
Methyl tert-butyl Ether (MTBE)	ug/L	0.41	0.41	U
1,1-Dichloroethane	ug/L	0.86	0.86	U
Vinyl Acetate	ug/L	0.40	0.40	U
2-Butanone (MEK)	ug/L	0.59	0.59	U
cis-1,2-Dichloroethylene	ug/L	0.51	0.51	U
Bromochloromethane	ug/L	0.33	0.33	U
Chloroform	ug/L	0.31	0.31	U
2,2-Dichloropropane	ug/L	0.82	0.82	U
1,2-Dichloroethane	ug/L	0.60	0.60	U
1,1,1-Trichloroethane	ug/L	0.44	0.44	U
1,1-Dichloropropene	ug/L	0.39	0.39	U
Carbon Tetrachloride	ug/L	0.60	0.60	U
Benzene	ug/L	0.20	0.20	U
Dibromomethane	ug/L	0.76	0.76	U
1,2-Dichloropropane	ug/L	0.76	0.76	U
Trichloroethene	ug/L	0.60	0.60	U
Bromodichloromethane	ug/L	0.60	0.60	U
2-Chloroethyl Vinyl Ether	ug/L	0.58	0.58	U
cis-1,3-Dichloropropene	ug/L	0.20	0.20	U
4-Methyl-2-pentanone (MIBK)	ug/L	0.93	0.93	U
trans-1,3-Dichloropropylene	ug/L	0.20	0.20	U
1,1,2-Trichloroethane	ug/L	0.46	0.46	U
Toluene	ug/L	0.45	0.45	U
1,3-Dichloropropane	ug/L	0.40	0.40	U
2-Hexanone	ug/L	0.99	0.99	U
Dibromochloromethane	ug/L	0.40	0.40	U
Ethylene Dibromide (EDB)	ug/L	0.67	0.67	U
Tetrachloroethylene (PCE)	ug/L	0.60	0.60	U
1,1,1,2-Tetrachloroethane	ug/L	0.64	0.64	U
Chlorobenzene	ug/L	0.56	0.56	U
Ethylbenzene	ug/L	0.26	0.26	U
Bromoform	ug/L	0.88	0.88	U
Styrene	ug/L	0.84	0.84	U
1,1,2,2-Tetrachloroethane	ug/L	0.20	0.20	U
1,2,3-Trichloropropane	ug/L	0.58	0.58	U
Isopropylbenzene	ug/L	0.80	0.80	U
Bromobenzene	ug/L	0.73	0.73	U
n-propylbenzene	ug/L	0.48	0.48	U
2-Chlorotoluene	ug/L	0.49	0.49	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
4-Chlorotoluene	ug/L	0.44	0.44	U
1,3,5-Trimethylbenzene	ug/L	0.68	0.68	U
tert-butylbenzene	ug/L	0.53	0.53	U
1,2,4-Trimethylbenzene	ug/L	0.54	0.54	U
sec-butylbenzene	ug/L	0.38	0.38	U
1,3-Dichlorobenzene	ug/L	0.43	0.43	U
1,4-Dichlorobenzene	ug/L	0.97	0.97	U
1,2-Dichlorobenzene	ug/L	0.63	0.63	U
n-Butylbenzene	ug/L	0.64	0.64	U
1,2-Dibromo-3-Chloropropane	ug/L	2.3	2.3	U
1,2,4-Trichlorobenzene	ug/L	0.84	0.84	U
Naphthalene	ug/L	0.73	0.73	U
Hexachlorobutadiene	ug/L	0.40	0.40	U
1,2,3-Trichlorobenzene	ug/L	0.86	0.86	U
Xylene (Total)	ug/L	0.56	0.56	U
1,2-Dichloroethane-d4 (S)	%	110	70-128	
Toluene-d8 (S)	%	99	77-119	
Bromofluorobenzene (S)	%	108	86-123	

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Dichlorodifluoromethane	ug/L	20	20	18	101	91		10		
Chloromethane	ug/L	20	20	18	101	88		13		
Vinyl Chloride	ug/L	20	19	18	95	89	70-130	6	20	
Bromomethane	ug/L	20	22	20	108	99		9		
Chloroethane	ug/L	20	20	19	100	93		7		
Trichlorofluoromethane	ug/L	20	23	21	116	103		12		
Acrolein (Propenal)	ug/L	100	110	100	109	104		5		
Acetone	ug/L	20	24	20	119	100		18		
1,1-Dichloroethylene	ug/L	20	20	20	99	98	70-130	2	20	
Iodomethane (Methyl Iodide)	ug/L	20	18	12	88	58		41		
Acrylonitrile	ug/L	20	20	19	98	96		3		
Methylene Chloride	ug/L	20	23	23	113	97		4		
Carbon Disulfide	ug/L	20	19	19	97	94		4		
trans-1,2-Dichloroethylene	ug/L	20	19	19	97	95		1		
Methyl tert-butyl Ether (MTBE)	ug/L	20	19	19	96	97	70-130	2	20	
1,1-Dichloroethane	ug/L	20	19	19	97	97		0		
Vinyl Acetate	ug/L	20	33	33	163	166		2		
2-Butanone (MEK)	ug/L	20	19	19	95	97		2		

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
cis-1,2-Dichloroethylene	ug/L	20	20	19	98	96	70-130	1	20	
Bromochloromethane	ug/L	20	21	20	104	100		4		
Chloroform	ug/L	20	19	19	96	95	70-130	1	20	
2,2-Dichloropropane	ug/L	20	21	20	107	102		5		
1,2-Dichloroethane	ug/L	20	19	20	97	99		2		
1,1,1-Trichloroethane	ug/L	20	19	19	96	94		2		
1,1-Dichloropropene	ug/L	20	19	18	95	92		3		
Carbon Tetrachloride	ug/L	20	19	18	93	92		1		
Benzene	ug/L	20	19	18	96	92	70-130	4	20	
Dibromomethane	ug/L	20	20	19	98	93		4		
1,2-Dichloropropane	ug/L	20	19	18	96	90		7		
Trichloroethene	ug/L	20	18	18	93	88	70-130	5	20	
Bromodichloromethane	ug/L	20	19	19	96	93		3		
2-Chloroethyl Vinyl Ether	ug/L	20	21	20	104	98		6		
cis-1,3-Dichloropropene	ug/L	20	20	19	99	95		5		
4-Methyl-2-pentanone (MIBK)	ug/L	20	19	19	95	97		2		
trans-1,3-Dichloropropylene	ug/L	20	20	19	100	97		3		
1,1,2-Trichloroethane	ug/L	20	19	18	96	91		5		
Toluene	ug/L	20	19	19	96	93	70-130	3	20	
1,3-Dichloropropane	ug/L	20	19	19	97	94		3		
2-Hexanone	ug/L	20	19	19	97	97		0		
Dibromochloromethane	ug/L	20	19	18	95	88		8		
Ethylene Dibromide (EDB)	ug/L	20	19	18	95	92		3		
Tetrachloroethylene (PCE)	ug/L	20	19	19	96	94	70-130	2	20	
1,1,1,2-Tetrachloroethane	ug/L	20	19	18	94	92		3		
Chlorobenzene	ug/L	20	20	19	98	93	70-130	6	20	
Ethylbenzene	ug/L	20	20	19	98	94	70-130	4	20	
Bromoform	ug/L	20	19	18	96	88		9		
Styrene	ug/L	20	20	18	98	90		9		
1,1,2,2-Tetrachloroethane	ug/L	20	22	20	108	102		6		
1,2,3-Trichloropropane	ug/L	20	21	19	104	95		8		
Isopropylbenzene	ug/L	20	19	19	97	96		1		
Bromobenzene	ug/L	20	21	20	103	98		5		
n-propylbenzene	ug/L	20	20	20	102	99		3		
2-Chlorotoluene	ug/L	20	20	19	99	96		3		
4-Chlorotoluene	ug/L	20	22	21	109	104		5		
1,3,5-Trimethylbenzene	ug/L	20	20	19	99	96		3		
tert-butylbenzene	ug/L	20	20	19	100	96		4		
1,2,4-Trimethylbenzene	ug/L	20	20	19	99	96	70-130	4	20	
sec-butylbenzene	ug/L	20	20	19	98	95		3		
1,3-Dichlorobenzene	ug/L	20	21	20	103	98	70-130	6	20	
1,4-Dichlorobenzene	ug/L	20	21	20	104	98		7		
1,2-Dichlorobenzene	ug/L	20	21	19	103	97	70-130	6	20	
n-Butylbenzene	ug/L	20	21	20	107	101		6		

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-Chloropropane	ug/L	20	23	22	116	108		7		
1,2,4-Trichlorobenzene	ug/L	20	21	20	106	100		6		
Naphthalene	ug/L	20	20	19	101	95		7		
Hexachlorobutadiene	ug/L	20	21	21	106	104		2		
1,2,3-Trichlorobenzene	ug/L	20	21	19	104	96		8		
Xylene (Total)	ug/L	60	59	56	99	94	70-130	5	20	
1,2-Dichloroethane-d4 (S)	%				99	104	70-128	5		
Toluene-d8 (S)	%				98	99	77-119	1		
Bromofluorobenzene (S)	%				101	104	86-123	3		

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Dichlorodifluoromethane	ug/L	0	200	390	136		
Chloromethane	ug/L	0	200	490	170		
Vinyl Chloride	ug/L	0	200	480	166	70-130	
Bromomethane	ug/L	0	200	500	173		
Chloroethane	ug/L	0	200	500	172		
Trichlorofluoromethane	ug/L	0	200	510	177		
Acrolein (Propenal)	ug/L	0	1000	1700	121		
Acetone	ug/L	90	200	580	155		
1,1-Dichloroethylene	ug/L	0	200	360	124	70-130	
Iodomethane (Methyl Iodide)	ug/L	0	200	260	91		
Acrylonitrile	ug/L	0	200	370	127		
Methylene Chloride	ug/L	8	200	430	148		
Carbon Disulfide	ug/L	0	200	310	108		
trans-1,2-Dichloroethylene	ug/L	0	200	360	124		
Methyl tert-butyl Ether (MTBE)	ug/L	0	200	390	134	70-130	
1,1-Dichloroethane	ug/L	0	200	350	120		
Vinyl Acetate	ug/L	0	200	690	239		
2-Butanone (MEK)	ug/L	4.1	200	390	134		
cis-1,2-Dichloroethylene	ug/L	0	200	370	127	70-130	
Bromochloromethane	ug/L	0	200	380	132		
Chloroform	ug/L	0	200	340	117	70-130	
2,2-Dichloropropane	ug/L	0	200	370	129		
1,2-Dichloroethane	ug/L	0	200	420	146		
1,1,1-Trichloroethane	ug/L	0	200	370	128		
1,1-Dichloropropene	ug/L	0	200	360	124		
Carbon Tetrachloride	ug/L	0	200	370	127		

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	0	200	340	117	70-130	
Dibromomethane	ug/L	0	200	340	117		
1,2-Dichloropropane	ug/L	0	200	360	125		
Trichloroethene	ug/L	0	200	320	111	70-130	
Bromodichloromethane	ug/L	0	200	360	125		
2-Chloroethyl Vinyl Ether	ug/L	0	200	360	125		
cis-1,3-Dichloropropene	ug/L	0	200	410	143		
4-Methyl-2-pentanone (MIBK)	ug/L	12	200	440	146		
trans-1,3-Dichloropropylene	ug/L	0	200	370	129		
1,1,2-Trichloroethane	ug/L	0	200	310	108		
Toluene	ug/L	0	200	320	112	70-130	
1,3-Dichloropropane	ug/L	0	200	370	127		
2-Hexanone	ug/L	0	200	580	200		
Dibromochloromethane	ug/L	0	200	310	109		
Ethylene Dibromide (EDB)	ug/L	0	200	320	111		
Tetrachloroethylene (PCE)	ug/L	0	200	370	127	70-130	
1,1,1,2-Tetrachloroethane	ug/L	0	200	310	107		
Chlorobenzene	ug/L	0	200	310	109	70-130	
Ethylbenzene	ug/L	0	200	340	117	70-130	
Bromoform	ug/L	0	200	370	127		
Styrene	ug/L	0	200	320	112		
1,1,2,2-Tetrachloroethane	ug/L	0	200	380	130		
1,2,3-Trichloropropane	ug/L	0	200	370	130		
Isopropylbenzene	ug/L	0	200	280	96		
Bromobenzene	ug/L	0	200	310	109		
n-propylbenzene	ug/L	0	200	300	104		
2-Chlorotoluene	ug/L	0	200	290	101		
4-Chlorotoluene	ug/L	0	200	330	115		
1,3,5-Trimethylbenzene	ug/L	0	200	280	99		
tert-butylbenzene	ug/L	0	200	270	95		
1,2,4-Trimethylbenzene	ug/L	0	200	290	101	70-130	
sec-butylbenzene	ug/L	0	200	280	98		
1,3-Dichlorobenzene	ug/L	0	200	300	106	70-130	
1,4-Dichlorobenzene	ug/L	0	200	300	104		
1,2-Dichlorobenzene	ug/L	0	200	290	101	70-130	
n-Butylbenzene	ug/L	0	200	310	107		
1,2-Dibromo-3-Chloropropane	ug/L	0	200	350	120		
1,2,4-Trichlorobenzene	ug/L	0	200	350	122		
Naphthalene	ug/L	0	200	260	89		
Hexachlorobutadiene	ug/L	0	200	360	124		
1,2,3-Trichlorobenzene	ug/L	0	200	330	113		
Xylene (Total)	ug/L	0	600	1000	120	70-130	

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Phone: (239) 674-8130
Fax: (239) 674-8128

QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%	113			134	69-134	
Toluene-d8 (S)	%	104			105	72-122	
Bromofluorobenzene (S)	%	110			96	79-126	

QUALITY CONTROL DATA QUALIFIERS

Workorder: F2000467 LCU PLANTS DEMO

QUALITY CONTROL PARAMETER QUALIFIERS

U The compound was analyzed for but not detected.

I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

V Method Blank Contamination

CERTIFICATE OF ANALYSIS

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Phone: (239) 674-8130
Fax: (239) 674-8128

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467001	FMBWWTP D6U			EPA 9056	WCAf/1070
F2000467002	FMBWWTP D6L			EPA 9056	WCAf/1070
F2000467003	FMBWWTP D5U			EPA 9056	WCAf/1070
F2000467004	FMBWWTP D5L			EPA 9056	WCAf/1070
F2000467005	FMBWWTP D4U			EPA 9056	WCAf/1070
F2000467006	FMBWWTP D4L			EPA 9056	WCAf/1070
F2000467007	FMBWWTP D3U			EPA 9056	WCAf/1070
F2000467008	FMBWWTP D3L			EPA 9056	WCAf/1070
F2000467009	FMBWWTP D2U			EPA 9056	WCAf/1070
F2000467010	FMBWWTP D2L			EPA 9056	WCAf/1070
F2000467011	FMBWWTP D9			EPA 9056	WCAf/1071
F2000467012	SCWWTP-D-4			EPA 9056	WCAf/1071
F2000467013	SCWWTP-D-2/2.5FT			EPA 9056	WCAf/1071
F2000467014	SCWWTP-D-3 / 2.5FT			EPA 9056	WCAf/1071
F2000467015	WWEWTP D-9			EPA 9056	WCAf/1071
F2000467016	WWEWTP D-1 DEEP			EPA 9056	WCAf/1071
F2000467017	WWEWTP D-1 TROUGH			EPA 9056	WCAf/1071
F2000467018	WWEWTP D-2			EPA 9056	WCAf/1071
F2000467001	FMBWWTP D6U			SM 2540G	WCAf/1077
F2000467002	FMBWWTP D6L			SM 2540G	WCAf/1077
F2000467003	FMBWWTP D5U			SM 2540G	WCAf/1077
F2000467004	FMBWWTP D5L			SM 2540G	WCAf/1077
F2000467005	FMBWWTP D4U			SM 2540G	WCAf/1077
F2000467006	FMBWWTP D4L			SM 2540G	WCAf/1077
F2000467007	FMBWWTP D3U			SM 2540G	WCAf/1077
F2000467008	FMBWWTP D3L			SM 2540G	WCAf/1077
F2000467009	FMBWWTP D2U			SM 2540G	WCAf/1077
F2000467010	FMBWWTP D2L			SM 2540G	WCAf/1077
F2000467011	FMBWWTP D9			SM 2540G	WCAf/1077
F2000467012	SCWWTP-D-4			SM 2540G	WCAf/1077
F2000467013	SCWWTP-D-2/2.5FT			SM 2540G	WCAf/1077
F2000467014	SCWWTP-D-3 / 2.5FT			SM 2540G	WCAf/1077

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Phone: (239) 674-8130
Fax: (239) 674-8128

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467015	WWEWTP D-9			SM 2540G	WCAf/1077
F2000467016	WWEWTP D-1 DEEP			SM 2540G	WCAf/1077
F2000467017	WWEWTP D-1 TROUGH			SM 2540G	WCAf/1077
F2000467018	WWEWTP D-2			SM 2540G	WCAf/1077
F2000467015	WWEWTP D-9	SW-846 3010A	DGMt/1143	SW-846 6010	ICPt/1090
F2000467018	WWEWTP D-2	SW-846 3010A	DGMt/1143	SW-846 6010	ICPt/1090
F2000467013	SCWWTP-D-2/2.5FT	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467014	SCWWTP-D-3 / 2.5FT	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467016	WWEWTP D-1 DEEP	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467017	WWEWTP D-1 TROUGH	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467015	WWEWTP D-9	SW-846 7470A	DGMt/1147	SW-846 7470A	CVAt/1046
F2000467018	WWEWTP D-2	SW-846 7470A	DGMt/1147	SW-846 7470A	CVAt/1046
F2000467007	FMBWWTP D3U	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467008	FMBWWTP D3L	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467009	FMBWWTP D2U	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467010	FMBWWTP D2L	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467011	FMBWWTP D9	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467012	SCWWTP-D-4	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467013	SCWWTP-D-2/2.5FT	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467014	SCWWTP-D-3 / 2.5FT	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467016	WWEWTP D-1 DEEP	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467017	WWEWTP D-1 TROUGH	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467007	FMBWWTP D3U	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467008	FMBWWTP D3L	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467009	FMBWWTP D2U	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467010	FMBWWTP D2L	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467011	FMBWWTP D9	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467012	SCWWTP-D-4	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467001	FMBWWTP D6U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467002	FMBWWTP D6L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467003	FMBWWTP D5U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467004	FMBWWTP D5L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467005	FMBWWTP D4U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467006	FMBWWTP D4L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467001	FMBWWTP D6U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467002	FMBWWTP D6L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467003	FMBWWTP D5U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467004	FMBWWTP D5L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467005	FMBWWTP D4U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467006	FMBWWTP D4L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467001	FMBWWTP D6U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467002	FMBWWTP D6L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467003	FMBWWTP D5U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467004	FMBWWTP D5L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467005	FMBWWTP D4U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467006	FMBWWTP D4L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467007	FMBWWTP D3U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467008	FMBWWTP D3L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467009	FMBWWTP D2U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467010	FMBWWTP D2L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467011	FMBWWTP D9	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209

Advanced
Environmental Laboratories, Inc.

6681 Southpoint Parkway
Jacksonville, Florida 32216
Office (904) 363-9350
Fax (904) 363-9354

Queue: ICPt

Batch Number: 1102

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: All holding times were met.

III. Method

Analysis: SW-846 6010

Preparation: SW-846 3010A

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Duplicates: All acceptance criteria were met.

D. Spikes: The matrix spike (MS) recoveries of silver and lead for F2000467001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in this matrix. The affected sample is qualified to indicate matrix interference.

E. Serial Diluion: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

G. Other:

Advanced Environmental Laboratories, Inc.

6681 Southpoint Parkway
Jacksonville, Florida 32216
Office (904) 363-9350
Fax (904) 363-9354

Queue: MSVt

Batch Number: 1209

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: All holding times were met.

III. Method

Analysis: SW-846 8260B

Preparation: SW-846 5030B

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: The Method Blank (MB) contained low levels of Methylene Chloride above the Method Detection Limit (MDL), a known laboratory contaminant. In accordance with AEL QA, all sample results found in the Method Blank are flagged with a V qualifier to indicate the data is an estimate. Samples F2000467001-11 are considered affected.

C. Surrogates:

D. Spikes: The matrix spike recoveries of Vinyl Chloride and Methyl tert-butyl Ether (MTBE) for F2000467001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS), Laboratory Control Sample Duplicate (LCSD) and %RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. The associated sample is qualified with a J4 to indicate an estimated result.

E. Internal Standard: All acceptance criteria were met.

F. Samples: TCLP samples F2000467001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011 were analyzed at the lowest dilution. In accordance with AEL protocol, all TCLP samples require a minimal dilution of 10X prior to analysis due to the complex matrices produced during the preparation method.

G. Other:

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☒ Fort Myers: 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Fax 239.674.8128 Lab ID: E
☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Fax 904.363.9354 Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E

52.377.2349 • Fax 352.395.6639 Lab ID: E82001
54.889.2288 • Fax 954.889.2281 Lab ID: E82535
13.630.9616 • Fax 813.630.4327 Lab ID: E84589

* F 2 0 0 0 4 6 7 *

Client Name: GHD	Project Name: LCU Plants Demo
Address: 5904 Hampton Oak Pkwy	Project Number: 11207990
Tampa, FL	PO Number:
Phone: 813-971-3882	FDEP Facility No:
FAX: 813-971-1862	FDEP Facility Address:
Contact: Jennifer Rogers	
Sampled By: W. McKinney	Special Instructions: 5* mix of soil/gravel/anthracite
Turn Around Time: ☒ STANDARD ☐ RUSH	
AEL Profile #:	☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED: TCLP VOC	TCLP metals(RCRA8 and copper)	total Sulfate	Preservation	Field-Filtered?	LABORATORY I.D. NUMBER
FMB WWTP	D6 U	G	1.27.20	9:40	S*			✓	✓	✓			001
FMB WWTP	D6 L	"	"	9:50	S*			✓	✓	✓			002
FMB WWTP	D5 U	"	"	10:20				✓	✓	✓			003
FMB WWTP	D5 L	"	"	10:30				✓	✓	✓			004
FMB WWTP	D4 U	"	"	11:20				✓	✓	✓			005
FMB WWTP	D4 L	"	"	11:30				✓	✓	✓			006
FMB WWTP	D3 U	"	"	12:15				✓	✓	✓			007
FMB WWTP	D3 L	"	"	12:25				✓	✓	✓			008
FMB WWTP	D2 U	"	"	13:15				✓	✓	✓			009
FMB WWTP	D2 L	"	"	13:25	↓			✓	✓	✓			010

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☐ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked

Temp. when received (observed) 5.9 °C Temp. when received (corrected) 5.9 °C

DCN: AD-051 Form last revised 02/12/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McKinney	1.27.20	16:00	[illegible]	1/27/20	1300
2	[illegible]	1/27/20	1310	[illegible]	1/29/20	1310
3						
4						

FOR DRINKING WATER USE:

(When PWS Information not otherwise supplied) PWS ID: _____

Contact Person: _____ Phone: _____

Supplier of Water: _____

Site-Address: _____

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☐ Fort Myers: 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Fax 239.674.8128 Lab ID: E84492
☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Fax 904.363.9354 Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E811095
☐ Gainesville: 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Fax 352.395.6639 Lab ID: E82001
☐ Miramar: 10200 USA Today Way, FL 33025 • 954.889.2288 • Fax 954.889.2281 Lab ID: E82535
☐ Tampa: 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Fax 813.630.4327 Lab ID: E84589

F2000467 Page 1 of 1

Client Name: GHD
Address: 5904 Hampton Oak Pkwy
Tampa, FL
Phone: 813-971-3882
FAX: 813-971-1862
Contact: Jennifer Rogers
Sampled By: W. McKinney
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile #:

Project Name: LCU Plants Demo
Project Number: 11207990
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions: S* = soil/sand/anthracite/gravel media
☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED: TCLP VOC	TCLP metals (RCRA8) and copper	total sulfate	LABORATORY I.D. NUMBER
	Preservation										
	Field-Filtered?										
FMB WWTP	D-9	C	1-27-20	14:00	S*			✓	✓	✓	011

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge
Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☑ Yes ☐ No ☑ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked
Temp. when received (observed) 3.7 °C Temp. when received (corrected) 3.7 °C

DCN: AD-051 Form last revised 02/12/2019
Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McK	1-27-20	16:00		1/27/20	1300
2		1/27/20	1310		1/29/20	1310
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID:
Contact Person: Phone :
Supplier of Water:
Site-Address:

Advanced Environmental Laboratories, Inc.
Florida's Largest Laboratory Network

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☐ Fort Myers: 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Fax 239.674.8128 Lab ID: E84492
☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Fax 904.363.9354 Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E811095
☐ Gainesville: 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Fax 352.395.6639 Lab ID: E82001
☐ Miramar: 10200 USA Today Way, FL 33025 • 954.889.2288 • Fax 954.889.2281 Lab ID: E82535
☐ Tampa: 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Fax 813.630.4327 Lab ID: E84589

F2000467 Page 1 of 1

Client Name: GHD
Address: 5904 Hampton Oak Pkwy.
Tampa, FL
Phone: 813-971-3882
FAX: 813-971-1862
Contact: Jennifer Rogers
Sampled By: W. McKinney
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile #:

Project Name: LCU Plants Demo
Project Number: 11207990
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED (RCRA 8 + copper)	TCLP Metals	Total Sulfate	LABORATORY I.D. NUMBER
							Preservation				
							Field-Filtered?				
SCWWTP -	D-4	G	1-28-20	10:30	SO	2		✓	✓		012
SCWWTP -	D-2/2.5'	"	"	12:15	"	2		✓	✓		013
SCWWTP	D-3/2.5'	"	"	12:40	"	2		✓	✓		014
WWEWTP	D-9	"	"	15:10	"	2		✓	✓		015
WWEWTP	D-1 Deep	"	"	16:00	"	2		✓	✓		016
WWE WTP	D-1 Trough	"	"	15:45	"	2		✓	✓		017
WWE WTP	D-2	"	1-29-20	8:50	"	2		✓	✓		018

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☒ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked

Temp. when received (observed) 5.7 °C Temp. when received (corrected) 5.8 °C

DCN: AD-051 Form last revised 02/12/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McK	1-29-20	12:30		1/27/20	1300
2		1/27/20	1310		1/29/20	1310
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID:
Contact Person: Phone :
Supplier of Water:
Site-Address:

EZ Profile™

Requested Facility: Okeechobee Landfill ❑ Unsure Profile Number: _____

❑ Multiple Generator Locations (Attach Locations) ☑ Request Certificate of Disposal ❑ Renewal? Original Profile Number: _____

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

1. Generator Name: Lee County Utilities - Waterway Estates WTP
2. Site Address: 4276 St Clair Ave W
   (City, State, ZIP) North Fort Myers, FL 33903
3. County: Lee County
4. Contact Name: _____
5. Email: _____
6. Phone: _____ 7. Fax: _____
8. Generator EPA ID: _____ ❑ N/A
9. State ID: _____ ❑ N/A

B. BILLING INFORMATION ❑ SAME AS GENERATOR

1. Billing Name: To be determined (bid contractor to Lee County)
2. Billing Address: _____
   (City, State, ZIP) _____
3. Contact Name: _____
4. Email: _____
5. Phone: _____ 6. Fax: _____
7. WM Hauled? ❑ Yes ☑ No
8. P.O. Number: _____
9. Payment Method: ❑ Credit Account ❑ Cash ❑ Credit Card

C. MATERIAL INFORMATION

1. Common Name: Seds/material/sands from process tanks at decommissioned WTP.
   Describe Process Generating Material: ❑ See Attached

   Non-contaminated sediments/filter material (e.g. sands) remaining in process tanks (i.e. filter, ID D-1) at the Waterway Estates (WWE) muncipal water treatment plant (WTP) that has been out-of-service/decommissioned for several years and is scheduled for demolition.

2. Material Composition and Contaminants: ❑ See Attached

1. Limited remaining sediments/filter-material - WTP filter tanks	100 %
2.	
3.	
4.	
Total comp. must be equal to or greater than 100%	≥100%

3. State Waste Codes: _____ ❑ N/A
4. Color: Gray/brown
5. Physical State at 70˚F: ☑ Solid ❑ Liquid ❑ Other: _____
6. Free Liquid Range Percentage: _____ to _____ ☑ N/A
7. pH: _____ to _____ ☑ N/A
8. Strong Odor: ❑ Yes ☑ No Describe: _____
9. Flash Point: ❑ <140˚F ❑ 140˚–199˚F ❑ ≥200˚ ☑ N/A

D. REGULATORY INFORMATION

1. EPA Hazardous Waste? ❑ Yes* ☑ No
   Code: _____
2. State Hazardous Waste? ❑ Yes ☑ No
   Code: _____
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? ❑ Yes* ☑ No
4. Contains Underlying Hazardous Constituents? ❑ Yes* ☑ No
5. From an industry regulated under Benzene NESHAP? ❑ Yes* ☑ No
6. Facility remediation subject to 40 CFR 63 GGGGG? ❑ Yes* ☑ No
7. CERCLA or State-mandated clean-up? ❑ Yes* ☑ No
8. NRC or State-regulated radioactive or NORM waste? ❑ Yes* ☑ No

***If Yes, see Addendum (page 2) for additional questions and space.**

9. Contains PCBs? → If Yes, answer a, b and c. ❑ Yes ☑ No
   a. Regulated by 40 CFR 761? ❑ Yes ❑ No
   b. Remediation under 40 CFR 761.61 (a)? ❑ Yes ❑ No
   c. Were PCB imported into the US? ❑ Yes ❑ No
10. Regulated and/or Untreated Medical/Infectious Waste? ❑ Yes ☑ No
11. Contains Asbestos? ❑ Yes ☑ No
    → If Yes: ❑ Non-Friable ❑ Non-Friable – Regulated ❑ Friable

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

1. Analytical attached ☑ Yes
   Please identify applicable samples and/or lab reports:

   Sample IDs are WWEWTP D-1 DEEP and WWEWTP D-1 TROUGH. Lab reports are AEL Report # F2000467 LCU PLANTS DEMO and Jupiter Report # 2066569.

2. Other information attached (such as MSDS)? ❑ Yes

F. SHIPPING AND DOT INFORMATION

1. ☑ One-Time Event ❑ Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: approx 30 cubic yards
   ❑ Tons ☑ Yards ❑ Drums ❑ Gallons ❑ Other: _____
3. Container Type and Size: To be determined.
4. USDOT Proper Shipping Name: ☑ N/A

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided. Any analytical data attached was derived from a sample that is representative as defined in 40 CFR 261 - Appendix 1 or by using an equivalent method. All changes occurring in the character of the material (i.e., changes in the process or new analytical) will be identified by the Generator and be disclosed to Waste Management prior to providing the material to Waste Management.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): Jennifer L. Rogers Date: 3-6-2020

Title: Project Engineer

Company: GHD Services, Inc.

Certification Signature

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118
www.jupiterlabs.com
clientservices@jupiterlabs.com

February 10, 2020

Jennifer Rogers
GHD - Tampa
5904 Hampton Oaks Pkwy
Suite F
Tampa, FL

RE: LOG# 2066569
Project ID: LCU Plants Demo 11207790
COC# 2066569

Dear Jennifer Rogers:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, January 30, 2020. Results reported herein conform to the most current NELAC standards, where applicable, unless indicated by * in the body of the report. The enclosed Chain of Custody is a component of this package and should be retained with the package and incorporated therein.

Results for all solid matrices are reported in dry weight unless otherwise noted. Results for all liquid matrices are reported as received in the laboratory unless otherwise noted. Results relate only to the samples received. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

Samples are disposed of after 30 days of their receipt by the laboratory unless extended storage is requested in writing. The laboratory maintains the right to charge storage fees for archived samples. This report will be archived for 5 years after which time it will be destroyed without further notice, unless prior arrangements have been made.

Certain analyses are subcontracted to outside NELAC certified laboratories, please see the Project Summary section of this report for NELAC certification numbers of laboratories used. A Statement of Qualifiers is available upon request.

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

Sincerely,

John Heyman for
Kacia Baldwin
V.P. of Operations

FDOH# E86546

CERTIFICATE OF ANALYSIS

CASE NARRATIVE

Jupiter Environmental Laboratories Inc. Lab Reference No./SDG: 2066569

Client: GHD Tampa

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody or a communication form is included in the addendum with this package.

II. METHODS

Samples were analyzed according to JEL's Standard Operating Procedures for following Method(s):
EPA 1311 (TCLP), EPA 8260C (TCLP), EPA 8270C (TCLP), SM 2540G

III. Analysis

Sample analysis proceeded normally with the exception of following:

Exceptions:

Method: EPA 8270C (TCLP)

Flag: J2|Surrogate recovery was outside defined limits due to matrix interference.
Following Samples/Analytes were flagged:

- LabID: 2066569001; SampleID: SCWWTP D-4
  Analytes: Nitrobenzene-d5

- LabID: 2066569002; SampleID: SCWWTP D-2/2.5'
  Analytes: 2,4,6-Tribromophenol; 2-Fluorobiphenyl; 2-Fluorophenol; Nitrobenzene-d5; Phenol-d5; p-Terphenyl-d14

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Jupiter Environmental Laboratories, Inc., both technically and for completeness, for other than the conditions detailed in the SDG Narrative. Release of the data contained in this hardcopy data package and in the electronic data submitted has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

SIGNED: DATE: 2/10/20

John Heyman for
Kacia Baldwin
V.P. of Operations

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

SAMPLE ANALYTE COUNT

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	Method	Analytes Reported
2066569001	SCWWTP D-4	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569002	SCWWTP D-2/2.5'	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569003	SCWWTP D-3/2.5'	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569004	WWE WTP D-9	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569005	WWE WTP D-1 Deep	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569006	WWE WTP D-1 Trough	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1
2066569007	WWE WTP D-2	EPA 8260C (TCLP)	14
		EPA 8270C (TCLP)	18
		SM 2540G	1

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SAMPLE SUMMARY

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2066569001	SCWWTP D-4	Soil/Solid	1/28/2020 10:30	1/30/2020 08:30
2066569002	SCWWTP D-2/2.5'	Soil/Solid	1/28/2020 12:15	1/30/2020 08:30
2066569003	SCWWTP D-3/2.5'	Soil/Solid	1/28/2020 12:40	1/30/2020 08:30
2066569004	WWE WTP D-9	Soil/Solid	1/28/2020 15:10	1/30/2020 08:30
2066569005	WWE WTP D-1 Deep	Soil/Solid	1/28/2020 16:00	1/30/2020 08:30
2066569006	WWE WTP D-1 Trough	Soil/Solid	1/28/2020 15:45	1/30/2020 08:30
2066569007	WWE WTP D-2	Soil/Solid	1/29/2020 08:50	1/30/2020 08:30

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569005** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-1 Deep** Date Collected: 1/28/2020 16:00

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B				
						Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Dibromofluoromethane (S)	96	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Toluene d8 (S)	98	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
4-Bromofluorobenzene (S)	98	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 16:40	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C				
						Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2-Fluorophenol (S)	55	%	20-110		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Phenol-d5 (S)	38	%	10-110		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Nitrobenzene-d5 (S)	107	%	30-110		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2-Fluorobiphenyl (S)	80	%	40-110		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
2,4,6-Tribromophenol (S)	66	%	10-120		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
p-Terphenyl-d14 (S)	85	%	30-140		1	2/5/2020 13:24	LAL	2/7/2020 00:13	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569005** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-1 Deep** Date Collected: 1/28/2020 16:00

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	94.4	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569006** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-1 Trough** Date Collected: 1/28/2020 15:45

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Volatiles by GC/MS										
Analysis Desc: EPA 8260C Full Scan (TCLP 1311)						Preparation Method: EPA 5030B				
						Analytical Method: EPA 8260C (TCLP)				
1,1-Dichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
1,2-Dichloroethane	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
1,4-Dichlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Benzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Carbon tetrachloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Chlorobenzene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Chloroform	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Methyl ethyl ketone (MEK)	U	ug/L	10.0	6.40	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Tetrachloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Trichloroethene	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Vinyl chloride	U	ug/L	10.0	4.00	10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Dibromofluoromethane (S)	94	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Toluene d8 (S)	99	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
4-Bromofluorobenzene (S)	103	%	70-130		10	2/7/2020 08:58	VS	2/7/2020 17:05	MK	
Semivolatiles by EPA 8270C										
Analysis Desc: 4 EPA 8270C Full Scan (TCLP 1311)						Preparation Method: EPA 3510C				
						Analytical Method: EPA 8270C (TCLP)				
1,4-Dichlorobenzene	U	ug/L	3.18	1.59	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2,4,5-Trichlorophenol	U	ug/L	0.560	0.280	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2,4,6-Trichlorophenol	U	ug/L	0.400	0.200	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2,4-Dinitrotoluene	U	ug/L	3.08	1.54	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2-Methylphenol	U	ug/L	3.46	1.73	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
3&4-Methylphenol	U	ug/L	2.48	1.24	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Hexachlorobenzene	U	ug/L	3.88	1.94	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Hexachlorobutadiene	U	ug/L	7.70	3.85	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Hexachloroethane	U	ug/L	1.90	0.950	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Nitrobenzene	U	ug/L	2.98	1.49	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Pentachlorophenol	U	ug/L	3.16	1.58	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Pyridine	U	ug/L	4.88	2.44	1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2-Fluorophenol (S)	48	%	20-110		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Phenol-d5 (S)	33	%	10-110		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Nitrobenzene-d5 (S)	109	%	30-110		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2-Fluorobiphenyl (S)	77	%	40-110		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
2,4,6-Tribromophenol (S)	74	%	10-120		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
p-Terphenyl-d14 (S)	88	%	30-140		1	2/5/2020 13:24	LAL	2/7/2020 00:49	VS	
Wet Chemistry										

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
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Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

ANALYTICAL RESULTS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID: **2066569006** Date Received: 1/30/2020 08:30 Matrix: Soil/Solid

Sample ID: **WWE WTP D-1 Trough** Date Collected: 1/28/2020 15:45

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
Analysis Desc: 2540G Percent Solids (Dryweight)					Analytical Method: SM 2540G					
Percent Solids (Dryweight)	73.6	%	0.1		1			2/5/2020 10:56	MAK	

FDOH# E86546

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

PARAMETER QUALIFIERS

J2	Surrogate recovery was outside defined limits due to matrix interference.

PROJECT COMMENTS

2066569	A reported value of U indicates that the compound was analyzed for but not detected above the MDL. A value flagged with an "i" flag indicates that the reported value is between the laboratory method detection limit and the practical quantitation limit.

FDOH# E86546

CERTIFICATE OF ANALYSIS

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

QC Batch: XXX/13211 Analysis Method: EPA 8270C (TCLP)

QC Batch Method: EPA 3510C

Associated Lab Samples: 2066569001, 2066569002, 2066569003, 2066569004, 2066569005, 2066569006, 2066569007, 2066570001, 2066570002, 2066570003, 2066570004, 2066570005, 2066570006, 2066570007, 2066570008, 2066647001, 2066647002

METHOD BLANK: 187663

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Semivolatiles by EPA 8270C				
2-Fluorophenol (S)	%	49	20-110	
Phenol-d5 (S)	%	34	10-110	
Nitrobenzene-d5 (S)	%	105	30-110	
2-Fluorobiphenyl (S)	%	81	40-110	
2,4,6-Tribromophenol (S)	%	80	10-120	
p-Terphenyl-d14 (S)	%	95	30-140	
Pyridine	ug/L	U	2.44	
1,4-Dichlorobenzene	ug/L	U	1.59	
2-Methylphenol	ug/L	U	1.73	
Hexachloroethane	ug/L	U	0.950	
Nitrobenzene	ug/L	U	1.49	
Hexachlorobutadiene	ug/L	U	3.85	
2,4,6-Trichlorophenol	ug/L	U	0.200	
2,4,5-Trichlorophenol	ug/L	U	0.280	
2,4-Dinitrotoluene	ug/L	U	1.54	
Hexachlorobenzene	ug/L	U	1.94	
Pentachlorophenol	ug/L	U	1.58	
3&4-Methylphenol	ug/L	U	1.24	

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Semivolatiles by EPA 8270C				
2-Fluorophenol (S)	%	56	20-110	
Phenol-d5 (S)	%	40	10-110	
Nitrobenzene-d5 (S)	%	115	30-110	
2-Fluorobiphenyl (S)	%	79	40-110	
2,4,6-Tribromophenol (S)	%	82	10-120	
p-Terphenyl-d14 (S)	%	94	30-140	
Pyridine	ug/L	U	2.44	
1,4-Dichlorobenzene	ug/L	U	1.59	
2-Methylphenol	ug/L	U	1.73	
Hexachloroethane	ug/L	U	0.950	
Nitrobenzene	ug/L	U	1.49	
Hexachlorobutadiene	ug/L	U	3.85	
2,4,6-Trichlorophenol	ug/L	U	0.200	
2,4,5-Trichlorophenol	ug/L	U	0.280	
2,4-Dinitrotoluene	ug/L	U	1.54	

Jupiter Environmental Laboratories, Inc.
150 S. Old Dixie Highway
Jupiter, FL 33458
Phone: (561)575-0030
Fax: (561)575-4118

QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

METHOD BLANK: 187663

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Hexachlorobenzene	ug/L	U	1.94	
Pentachlorophenol	ug/L	U	1.58	
3&4-Methylphenol	ug/L	U	1.24	

LABORATORY CONTROL SAMPLE & LCSD: 187664 187665

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Semivolatiles by EPA 8270C										
2-Fluorophenol (S)	%				45	45	20-110	0	40	
Phenol-d5 (S)	%				32	33	10-110	0	40	
Nitrobenzene-d5 (S)	%				110	105	30-110	5	40	
2-Fluorobiphenyl (S)	%				79	79	40-110	3	40	
2,4,6-Tribromophenol (S)	%				86	82	10-120	3	40	
p-Terphenyl-d14 (S)	%				91	95	30-140	3	40	
Pyridine	ug/L		U	U				0	40	
1,4-Dichlorobenzene	ug/L	25.2	13.0	14.9	52	59	20-100	14	40	
2-Methylphenol	ug/L		U	U				0	40	
Hexachloroethane	ug/L		U	U				0	40	
Nitrobenzene	ug/L		U	U				0	40	
Hexachlorobutadiene	ug/L		U	U				0	40	
2,4,6-Trichlorophenol	ug/L		U	U				0	40	
2,4,5-Trichlorophenol	ug/L		U	U				0	40	
2,4-Dinitrotoluene	ug/L	25.2	18.9	18.3	75	73	30-140	3	40	
Hexachlorobenzene	ug/L		U	U				0	40	
Pentachlorophenol	ug/L	49.6	40.9	39.1	83	79	20-120	5	40	
3&4-Methylphenol	ug/L		U	U				0	40	

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter Environmental Laboratories, Inc.
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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

QC Batch: VXX/9364 Analysis Method: EPA 8260C (TCLP)

QC Batch Method: EPA 5030B

Associated Lab Samples: 2066569001 2066569002 2066569003 2066569004 2066569005 2066569006 2066569007

METHOD BLANK: 187951

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Volatiles by GC/MS				
Dibromofluoromethane (S)	%	94	70-130	
Toluene d8 (S)	%	95	70-130	
4-Bromofluorobenzene (S)	%	93	70-130	
Vinyl chloride	ug/L	U	0.400	
1,1-Dichloroethene	ug/L	U	0.400	
Methyl ethyl ketone (MEK)	ug/L	U	0.640	
Chloroform	ug/L	U	0.400	
1,2-Dichloroethane	ug/L	U	0.400	
Carbon tetrachloride	ug/L	U	0.400	
Benzene	ug/L	U	0.400	
Trichloroethene	ug/L	U	0.400	
Tetrachloroethene	ug/L	U	0.400	
Chlorobenzene	ug/L	U	0.400	
1,4-Dichlorobenzene	ug/L	U	0.400	

LABORATORY CONTROL SAMPLE & LCSD: 187952 187953

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Volatiles by GC/MS										
Dibromofluoromethane (S)	%				96	101	70-130	5	75	
Toluene d8 (S)	%				97	98	70-130	0.3	75	
4-Bromofluorobenzene (S)	%				91	93	70-130	1	75	
Vinyl chloride	ug/L	49.8	42.6	41.2	86	83	70-135	3	75	
1,1-Dichloroethene	ug/L	49.5	43.8	43.9	88	89	70-135	0.2	75	
Methyl ethyl ketone (MEK)	ug/L	50.2	47.0	42.4	94	85	70-135	10	75	
Chloroform	ug/L	49.7	46.4	46.6	93	94	70-135	0.4	75	
1,2-Dichloroethane	ug/L	49.9	44.3	44.4	89	89	70-135	0.2	75	
Carbon tetrachloride	ug/L	50.3	48.6	49.3	97	98	70-135	1	75	
Benzene	ug/L	49.7	45.9	46.8	92	94	70-135	2	75	
Trichloroethene	ug/L	50	47.0	48.1	94	96	70-135	2	75	
Tetrachloroethene	ug/L	49.9	52.1	51.3	104	103	70-135	2	75	
Chlorobenzene	ug/L	49.9	51.6	51.6	103	103	70-135	0	75	
1,4-Dichlorobenzene	ug/L	50.5	46.3	45.9	92	91	70-135	0.9	75	

FDOH# E86546

CERTIFICATE OF ANALYSIS

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

LABORATORY CONTROL SAMPLE & LCSD: 187954 187955

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Dibromofluoromethane (S)	%				95	96	70-130	1	75	
Toluene d8 (S)	%				95	97	70-130	1	75	
4-Bromofluorobenzene (S)	%				94	96	70-130	1	75	

SAMPLE DUPLICATE: 187956 Original: 2066665005

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Volatiles by GC/MS						
Dibromofluoromethane (S)	%	38.3		3	75	
Toluene d8 (S)	%	37.3		2	75	
4-Bromofluorobenzene (S)	%	37.3		4	75	
Vinyl chloride	ug/L	0	U	0	75	
1,1-Dichloroethene	ug/L	0	U	0	75	
Methyl ethyl ketone (MEK)	ug/L		U			
Chloroform	ug/L	0	U	0	75	
1,2-Dichloroethane	ug/L	0	U	0	75	
Carbon tetrachloride	ug/L	0	U	0	75	
Benzene	ug/L	0	U	0	75	
Trichloroethene	ug/L	0	U	0	75	
Tetrachloroethene	ug/L	0	U	0	75	
Chlorobenzene	ug/L	0	U	0	75	
1,4-Dichlorobenzene	ug/L	0	U	0	75	

SAMPLE DUPLICATE: 187957 Original: 2066667001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Volatiles by GC/MS						
Dibromofluoromethane (S)	%	38.3		0.8	75	
Toluene d8 (S)	%	38.4		0.5	75	
4-Bromofluorobenzene (S)	%	36.6		1	75	
Vinyl chloride	ug/L	0	U	0	75	
1,1-Dichloroethene	ug/L	0	U	0	75	
Methyl ethyl ketone (MEK)	ug/L	0	U	0	75	
Chloroform	ug/L	0	U	0	75	
1,2-Dichloroethane	ug/L	0	U	0	75	
Carbon tetrachloride	ug/L	0	U	0	75	
Benzene	ug/L	0	U	0	75	
Trichloroethene	ug/L	0	U	0	75	
Tetrachloroethene	ug/L	0	U	0	75	

FDOH# E86546

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QUALITY CONTROL DATA

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

SAMPLE DUPLICATE: 187957 Original: 2066667001

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Qualifiers
Chlorobenzene	ug/L	0	U	0	75	
1,4-Dichlorobenzene	ug/L	0	U	0	75	

FDOH# E86546

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2066569

Project ID: LCU Plants Demo 11207790

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2066569001	**SCWWTP D-4**	SM 2540G	WGR/4296		
2066569002	**SCWWTP D-2/2.5'**	SM 2540G	WGR/4296		
2066569003	**SCWWTP D-3/2.5'**	SM 2540G	WGR/4296		
2066569004	**WWE WTP D-9**	SM 2540G	WGR/4296		
2066569005	**WWE WTP D-1 Deep**	SM 2540G	WGR/4296		
2066569006	**WWE WTP D-1 Trough**	SM 2540G	WGR/4296		
2066569007	**WWE WTP D-2**	SM 2540G	WGR/4296		
2066569001	**SCWWTP D-4**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6906
2066569002	**SCWWTP D-2/2.5'**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6906
2066569003	**SCWWTP D-3/2.5'**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569004	**WWE WTP D-9**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569005	**WWE WTP D-1 Deep**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569006	**WWE WTP D-1 Trough**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569007	**WWE WTP D-2**	EPA 3510C	XXX/13211	EPA 8270C (TCLP)	XMS/6907
2066569001	**SCWWTP D-4**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569002	**SCWWTP D-2/2.5'**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569003	**SCWWTP D-3/2.5'**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569004	**WWE WTP D-9**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569005	**WWE WTP D-1 Deep**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569006	**WWE WTP D-1 Trough**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172
2066569007	**WWE WTP D-2**	EPA 5030B	VXX/9364	EPA 8260C (TCLP)	VMS/9172

FDOH# E86546

CERTIFICATE OF ANALYSIS

Jupiter
Environmental Laboratories, Inc.

www.jupiterlabs.com
150 S. Old Dixie Highway, Jupiter, FL 33458
(561) 575-0030 • (888) 287-3218 • clientservices@jupiterlabs.com

J.E.L. Log # 2066569
P.O. # _____
Quote # _____

Company Name GHD
Address 5904 Hampton Oak Pkwy
City Tampa State FL Zip
Sampling Site Address
Attn: Jennifer Rogers Email
Project Name LCU Plants Demo Project # 11207790
Sampler Name/Signature W. McKinney

LAB ANALYSIS

Requested Turnaround Time
Note: Rush requests subject to acceptance by the laboratory
X Standard
___ Expedited
Due___/___/___

#	Sample Label (Client ID)	Collected Date	Collected Time	Matrix Code*	# of Cont	Pres Codes	Parameters: TCLP VOC's Full List	Parameters: TCLP SVOC's	Field Filtered (Y/N)	Comments
1	SCWWTP D-4	1.28.20	10:30	SO	2		✓	✓		
2	SCWWTP D-2/2.5'	"	12:15	"	"		✓	✓		
3	SCWWTP D-3/2.5'	"	12:40	"	"		✓	✓		
4	WWE WTP D-9	"	15:10	"	"		✓	✓		
5	WWE WTP D-1 Deep	"	16:00	"	"		✓	✓		
6	WWE WTP D-1 Trough	"	15:45	"	"		✓	✓		
7	WWE WTP D-2	1.29.20	8:50	"	"		✓	✓		
8										
9										
10										

Matrix Codes*

S	Soil/Solid Sediment	SW	Surface Water
GW	Ground Water	SL	Sludge
WW	Waste Water	O	Other (Please Specify)
DW	Drinking Water		

Pres Codes

A-	none	I-	Ice
B-	HNO_3	O-	Other
C-	H_2SO_4	M-	MeOH
D-	NaOH	N -	$Na_2S_2O_3$
E-	HCl	Z-	ZnAc

Relinquished by	Date	Time	Received by	Date	Time
W. McK	1.29.20	15:30	[signature]	1/29/20	1620
[signature]	1/29/20	1900	FLX	1/29/20	1900
FLX	1/30/20	0830	[signature]	1/30/20	0830

QA/QC level with report
None ___1___2___3___ See price guide for applicable fees

FDEP Dry Cleaning ❑ FDEP UST Pre-Approval ❑
SFWMD ❑ ADaPT ❑ DOT ❑

Temp Control: 2.3 °C

Page_____of_____

2066569

SAMPLE RECEIPT CONFIRMATION SHEET

Client Information

SDG:	2066569	**Profile:**	2938
Client:	GHD Tampa	**Project:**	J. Rogers
Level:	1	**Date Rec'd:**	1/30/2020 8:30:00 AM
Rec'd via:	courier		

Cooler Check

ID	Temp	# of samples	Security Tape Present	Security Tape Intact	Method of Receipt	Comments
	2.3	7	☐	☐		

Checked By: MD

Sample Verification

Loose Caps?	No	**All Samples on COC accounted For?**	Yes
Broken Containers?	No	**All Samples on COC?**	Yes
pH Verified?	No	**Written on Internal COC?**	No
pH Strip Lot #		**Sample Vol. Suff. For Analysis?**	Yes
Acid Preserved Samples Lot #		**Samples Rec'd W/I Hold Time?**	Yes
Base Preserved Samples Lot #		**Are All Samples to be Analyzed?**	Yes
Samples Received From	courier	**Correct Sample Containers?**	Yes
Soil Origin (Domestic/Foreign	Domestic	**COC Comments written on COC?**	No
Site Location/Project on COC?	Yes	**Samplers Initials on COC?**	Yes
Client Project # on COC?	Yes	**Sample Date/Time Indicated?**	Yes
Project Mgr. Indicated on COC	Yes	**TAT Requested:**	STD
COC relinquished/Dated by Client?	Yes	**Client Requests Verbal Results?**	No
COC Received/Dated by JEL	Yes	**Client Notified of discrepancies?**	No
JEL to Conduct ALL Analyses?	Yes	**Do VOC vials have headspace or a bubble <6mm (1/4")?**	N/A

Subcontract Analysis

Parameter	Via	Lab Name	Comments

Advanced Environmental Laboratories, Inc.

Advanced Environmental Laboratories, Inc
13100 Westlinks Terrace, Unit 10 Ft. Myers FL 33913
Payments: P.O. Box 551580Jacksonville, FL 32255-1580
Phone: (239) 674-8130
Fax: (239) 674-8128

February 11, 2020

Jennifer L. Rogers
GHD
2675 Winkler Ave, Suite 180
Fort Myers, FL 33901

RE: Workorder: F2000467 LCU PLANTS DEMO

Dear Jennifer Rogers:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, January 29, 2020. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

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

Sincerely,

Josh Snead - Laboratory Manager
JSnead@aellab.com

Enclosures

CERTIFICATE OF ANALYSIS

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Fax: (239) 674-8128

SAMPLE SUMMARY

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Matrix	Date Collected	Date Received
F2000467001	FMBWWTP D6U	Soil	1/27/2020 09:40	1/29/2020 13:10
F2000467002	FMBWWTP D6L	Soil	1/27/2020 09:50	1/29/2020 13:10
F2000467003	FMBWWTP D5U	Soil	1/27/2020 10:20	1/29/2020 13:10
F2000467004	FMBWWTP D5L	Soil	1/27/2020 10:30	1/29/2020 13:10
F2000467005	FMBWWTP D4U	Soil	1/27/2020 11:20	1/29/2020 13:10
F2000467006	FMBWWTP D4L	Soil	1/27/2020 11:30	1/29/2020 13:10
F2000467007	FMBWWTP D3U	Soil	1/27/2020 12:15	1/29/2020 13:10
F2000467008	FMBWWTP D3L	Soil	1/27/2020 12:25	1/29/2020 13:10
F2000467009	FMBWWTP D2U	Soil	1/27/2020 13:15	1/29/2020 13:10
F2000467010	FMBWWTP D2L	Soil	1/27/2020 13:25	1/29/2020 13:10
F2000467011	FMBWWTP D9	Soil	1/27/2020 14:00	1/29/2020 13:10
F2000467012	SCWWTP-D-4	Soil	1/28/2020 10:30	1/29/2020 13:10
F2000467013	SCWWTP-D-2/2.5FT	Soil	1/28/2020 12:15	1/29/2020 13:10
F2000467014	SCWWTP-D-3 / 2.5FT	Soil	1/28/2020 12:40	1/29/2020 13:10
F2000467015	WWEWTP D-9	Soil	1/28/2020 15:10	1/29/2020 13:10
F2000467016	WWEWTP D-1 DEEP	Soil	1/28/2020 16:00	1/29/2020 13:10
F2000467017	WWEWTP D-1 TROUGH	Soil	1/28/2020 15:45	1/29/2020 13:10
F2000467018	WWEWTP D-2	Soil	1/29/2020 08:50	1/29/2020 13:10

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467015** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **WWEWTP D-9** Date Collected: 01/28/20 15:10

Results for sample F2000467015 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	1/31/2020 18:23	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	1/31/2020 18:23	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	1/31/2020 14:53	T
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**160**		**mg/Kg**	**1**	19	2.5	1/30/2020 16:35	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**53**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467016** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **WWEWTP D-1 DEEP** Date Collected: 01/28/20 16:00

Results for sample F2000467016 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	1/31/2020 20:12	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	1/31/2020 20:12	T
Cadmium	**0.0039**	**I**	**mg/L**	**1**	0.0090	0.0024	1/31/2020 20:12	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	1/31/2020 20:12	T
Copper	**0.074**	**I**	**mg/L**	**1**	0.080	0.014	1/31/2020 20:12	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	1/31/2020 20:12	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	1/31/2020 20:12	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	1/31/2020 20:12	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467016** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **WWEWTP D-1 DEEP** Date Collected: 01/28/20 16:00

Results for sample F2000467016 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/3/2020 14:41	T
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**7.2**	**I**	**mg/Kg**	**1**	15	2.0	1/30/2020 16:47	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**38**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467017** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **WWEWTP D-1 TROUGH** Date Collected: 01/28/20 15:45

Results for sample F2000467017 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	1/31/2020 20:16	T
Barium	**1.7**	**U**	**mg/L**	**1**	2.0	1.7	1/31/2020 20:16	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	1/31/2020 20:16	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	1/31/2020 20:16	T
Copper	**0.049**	**I**	**mg/L**	**1**	0.080	0.014	1/31/2020 20:16	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	1/31/2020 20:16	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	1/31/2020 20:16	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	1/31/2020 20:16	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	2/3/2020 14:43	T
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**8.7**	**I**	**mg/Kg**	**1**	9.7	1.3	1/30/2020 17:00	F

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ANALYTICAL RESULTS

Workorder: F2000467 LCU PLANTS DEMO

Lab ID: **F2000467017** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **WWEWTP D-1 TROUGH** Date Collected: 01/28/20 15:45

Results for sample F2000467017 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**7.2**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

Lab ID: **F2000467018** Date Received: 01/29/20 13:10 Matrix: Soil

Sample ID: **WWEWTP D-2** Date Collected: 01/29/20 08:50

Results for sample F2000467018 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS, TCLP								
Analysis Desc: 1311/6010B Analysis,TCLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Arsenic	**0.028**	**U**	**mg/L**	**1**	0.10	0.028	1/31/2020 18:27	T
Barium	**2.1**		**mg/L**	**1**	2.0	1.7	1/31/2020 18:27	T
Cadmium	**0.0024**	**U**	**mg/L**	**1**	0.0090	0.0024	1/31/2020 18:27	T
Chromium	**0.020**	**U**	**mg/L**	**1**	0.025	0.020	1/31/2020 18:27	T
Copper	**0.047**	**I**	**mg/L**	**1**	0.080	0.014	1/31/2020 18:27	T
Lead	**0.078**	**U**	**mg/L**	**1**	0.10	0.078	1/31/2020 18:27	T
Selenium	**0.12**	**U**	**mg/L**	**1**	0.30	0.12	1/31/2020 18:27	T
Silver	**0.034**	**U**	**mg/L**	**1**	0.050	0.034	1/31/2020 18:27	T
Analysis Desc: 1311/7470A Analysis,TCLP	Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A							
Mercury	**0.00025**	**U**	**mg/L**	**1**	0.00050	0.00025	1/31/2020 14:55	T
WET CHEMISTRY								
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Sulfate	**23**	**I**	**mg/Kg**	**1**	41	5.3	1/30/2020 17:12	F
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**78**		**%**	**1**	0.0010	0.0010	1/30/2020 15:23	F

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ANALYTICAL RESULTS QUALIFIERS

Workorder: F2000467 LCU PLANTS DEMO

PARAMETER QUALIFIERS

U	The compound was analyzed for but not detected.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
V	Method Blank Contamination
J4	Estimated Result

LAB QUALIFIERS

F	DOH Certification #E84492(AEL-F)(FL NELAC Certification)
T	DOH Certification #E84589(AEL-T)(FL NELAC Certification)

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: WCAf/1070 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006, F2000467007,

METHOD BLANK: 3366452

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Sulfate	mg/Kg	1.3	1.3	U

LABORATORY CONTROL SAMPLE: 3366453

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
WET CHEMISTRY						
Sulfate	mg/Kg	49	48	99	90-110	

QC Batch: WCAf/1071 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: F2000467011, F2000467012, F2000467013, F2000467014, F2000467015, F2000467016, F2000467017, F2000467018

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3366456 3366457 Original: F2000467011

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
WET CHEMISTRY											
Sulfate	mg/Kg	930	470	1500	1500	102	102	90-110	0	10	

QC Batch: DGMt/1143 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 01/31/2020 10:00
Associated Lab Samples: F2000467015, F2000467018

METHOD BLANK: 3368232

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3368232

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

LABORATORY CONTROL SAMPLE: 3368233

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.8	95	80-120	
Arsenic	mg/L	4	3.8	94	80-120	
Barium	mg/L	4	3.9	96	80-120	
Cadmium	mg/L	4	3.7	92	80-120	
Chromium	mg/L	4	3.8	96	80-120	
Copper	mg/L	4	4.0	100	80-120	
Lead	mg/L	4	3.5	88	80-120	
Selenium	mg/L	4	3.6	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368234 3368235 Original: T2002009001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0	4	3.7	3.7	92	93	75-125	1	20	
Arsenic	mg/L	0	4	3.8	3.8	95	95	75-125	0	20	
Barium	mg/L	0.27	4	3.9	3.8	96	96	75-125	0	20	
Cadmium	mg/L	5e-005	4	3.5	3.5	87	87	75-125	0	20	
Chromium	mg/L	0.017	4	3.7	3.7	93	93	75-125	0	20	
Copper	mg/L	0	4	3.9	3.9	97	97	75-125	0	20	
Lead	mg/L	0	4	3.3	3.3	84	84	75-125	0	20	
Selenium	mg/L	0.066	4	3.7	3.6	92	90	75-125	2	20	

QC Batch: DGMt/1144 Analysis Method: SW-846 6010

QC Batch Method: SW-846 3010A Prepared: 01/31/2020 10:00

Associated Lab Samples: F2000467013, F2000467014, F2000467016, F2000467017

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3368297

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Copper	mg/L	0.014	0.014	U

LABORATORY CONTROL SAMPLE: 3368298

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	4.4	111	80-120	
Arsenic	mg/L	4	4.6	116	80-120	
Barium	mg/L	4	4.3	109	80-120	
Cadmium	mg/L	4	4.4	111	80-120	
Chromium	mg/L	4	4.4	111	80-120	
Copper	mg/L	4	4.7	118	80-120	
Lead	mg/L	4	4.2	105	80-120	
Selenium	mg/L	4	4.5	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368299 3368300 Original: F2000467017

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.0014	4	4.3	4.0	107	100	75-125	7	20	
Arsenic	mg/L	0	4	4.4	4.1	111	103	75-125	7	20	
Barium	mg/L	0.38	4	4.4	4.1	110	103	75-125	7	20	
Cadmium	mg/L	0	4	4.2	3.8	105	96	75-125	8	20	
Chromium	mg/L	0.0026	4	4.2	3.9	105	99	75-125	7	20	
Copper	mg/L	0.049	4	4.6	4.3	113	105	75-125	7	20	
Lead	mg/L	0	4	3.9	3.7	98	91	75-125	7	20	
Selenium	mg/L	0	4	4.3	4.0	107	99	75-125	8	20	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: DGMt/1147 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 01/31/2020 11:00
Associated Lab Samples: F2000467015, F2000467018

METHOD BLANK: 3368654

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3368655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0051	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3368656 3368657 Original: T2002009001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0.00022	0.005	0.0054	0.0054	108	107	80-120	0	20	

QC Batch: DGMt/1154 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 02/03/2020 10:00
Associated Lab Samples: F2000467007, F2000467008, F2000467009, F2000467010, F2000467011, F2000467012

METHOD BLANK: 3369710

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE: 3369711

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.4	86	80-120	
Arsenic	mg/L	4	3.5	87	80-120	
Barium	mg/L	4	3.5	88	80-120	
Cadmium	mg/L	4	3.4	85	80-120	
Chromium	mg/L	4	3.5	86	80-120	
Copper	mg/L	4	3.8	95	80-120	
Selenium	mg/L	4	3.3	83	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3369712 3369713 Original: F2000467007

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.0036	4	3.7	3.7	92	93	75-125	1	20	
Arsenic	mg/L	0	4	3.8	3.8	94	95	75-125	1	20	
Barium	mg/L	0.22	4	3.9	3.9	97	98	75-125	1	20	
Cadmium	mg/L	0	4	3.7	3.8	93	94	75-125	1	20	
Chromium	mg/L	0.0028	4	3.7	3.7	92	93	75-125	1	20	
Copper	mg/L	0.02	4	4.0	4.1	100	101	75-125	1	20	
Lead	mg/L	0	4	3.4	3.4	86	86	75-125	0	20	
Selenium	mg/L	0	4	3.6	3.6	89	91	75-125	2	20	

QC Batch: DGMt/1156 Analysis Method: SW-846 7470A

QC Batch Method: SW-846 7470A Prepared: 02/03/2020 11:00

Associated Lab Samples: F2000467013, F2000467014, F2000467016, F2000467017

METHOD BLANK: 3370208

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3370209

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0054	107	80-120	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3370210 3370211 Original: F2000467013

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0	0.005	0.0050	0.0050	101	99	80-120	2	20	

QC Batch: DGMt/1157 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 02/03/2020 11:00
Associated Lab Samples: F2000467007, F2000467008, F2000467009, F2000467010, F2000467011, F2000467012

METHOD BLANK: 3370217

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3370218

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0051	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3370219 3370220 Original: F2000467007

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0.00052	0.005	0.0054	0.0058	99	106	80-120	7	20	

QC Batch: DGMt/1166 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 02/04/2020 10:00
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3371104

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.034	0.034	U
Arsenic	mg/L	0.028	0.028	U
Barium	mg/L	1.7	1.7	U
Cadmium	mg/L	0.0024	0.0024	U
Chromium	mg/L	0.020	0.020	U
Copper	mg/L	0.014	0.014	U
Lead	mg/L	0.078	0.078	U
Selenium	mg/L	0.12	0.12	U

LABORATORY CONTROL SAMPLE: 3371105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Silver	mg/L	4	3.2	81	80-120	
Arsenic	mg/L	4	3.7	91	80-120	
Barium	mg/L	4	3.4	85	80-120	
Cadmium	mg/L	4	3.5	86	80-120	
Chromium	mg/L	4	3.4	86	80-120	
Copper	mg/L	4	3.6	89	80-120	
Selenium	mg/L	4	3.6	91	80-120	

LABORATORY CONTROL SAMPLE: 3371105

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	mg/L	4	3.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3371106 3371107 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Silver	mg/L	0.012	4	2.9	2.9	72	71	75-125	1	20	
Arsenic	mg/L	0	4	3.3	3.3	82	82	75-125	0	20	
Barium	mg/L	0.22	4	3.2	3.2	79	79	75-125	0	20	
Cadmium	mg/L	0	4	3.1	3.0	76	76	75-125	0	20	
Chromium	mg/L	0.0037	4	3.0	3.0	76	76	75-125	0	20	
Copper	mg/L	0.012	4	3.2	3.2	79	79	75-125	0	20	
Lead	mg/L	0	4	2.7	2.7	69	68	75-125	0	20	
Selenium	mg/L	0	4	3.2	3.1	80	78	75-125	2	20	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

QC Batch: DGMt/1171 Analysis Method: SW-846 7470A
QC Batch Method: SW-846 7470A Prepared: 02/04/2020 10:00
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006

METHOD BLANK: 3371652

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Mercury	mg/L	0.00025	0.00025	U

LABORATORY CONTROL SAMPLE: 3371653

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0047	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3371654 3371655 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	mg/L	0	0.005	0.0049	0.0045	97	91	80-120	7	20	

QC Batch: MSVt/1208 Analysis Method: SW-846 8260B
QC Batch Method: SW-846 5030B Prepared: 02/05/2020 15:04
Associated Lab Samples: F2000467001, F2000467002, F2000467003, F2000467004, F2000467005, F2000467006, F2000467007,

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Dichlorodifluoromethane	ug/L	0.36	0.36	U
Chloromethane	ug/L	0.53	0.53	U
Vinyl Chloride	ug/L	0.20	0.20	U
Bromomethane	ug/L	0.97	0.97	U
Chloroethane	ug/L	0.38	0.38	U
Trichlorofluoromethane	ug/L	0.84	0.84	U
Acrolein (Propenal)	ug/L	3.5	3.5	U
Acetone	ug/L	1.0	1.0	U
1,1-Dichloroethylene	ug/L	0.70	0.70	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Iodomethane (Methyl Iodide)	ug/L	0.65	0.65	U
Acrylonitrile	ug/L	1.9	1.9	U
Methylene Chloride	ug/L	4.0	1.0	
Carbon Disulfide	ug/L	0.49	0.49	U
trans-1,2-Dichloroethylene	ug/L	0.50	0.50	U
Methyl tert-butyl Ether (MTBE)	ug/L	0.41	0.41	U
1,1-Dichloroethane	ug/L	0.86	0.86	U
Vinyl Acetate	ug/L	0.40	0.40	U
2-Butanone (MEK)	ug/L	0.59	0.59	U
cis-1,2-Dichloroethylene	ug/L	0.51	0.51	U
Bromochloromethane	ug/L	0.33	0.33	U
Chloroform	ug/L	0.31	0.31	U
2,2-Dichloropropane	ug/L	0.82	0.82	U
1,2-Dichloroethane	ug/L	0.60	0.60	U
1,1,1-Trichloroethane	ug/L	0.44	0.44	U
1,1-Dichloropropene	ug/L	0.39	0.39	U
Carbon Tetrachloride	ug/L	0.60	0.60	U
Benzene	ug/L	0.20	0.20	U
Dibromomethane	ug/L	0.76	0.76	U
1,2-Dichloropropane	ug/L	0.76	0.76	U
Trichloroethene	ug/L	0.60	0.60	U
Bromodichloromethane	ug/L	0.60	0.60	U
2-Chloroethyl Vinyl Ether	ug/L	0.58	0.58	U
cis-1,3-Dichloropropene	ug/L	0.20	0.20	U
4-Methyl-2-pentanone (MIBK)	ug/L	0.93	0.93	U
trans-1,3-Dichloropropylene	ug/L	0.20	0.20	U
1,1,2-Trichloroethane	ug/L	0.46	0.46	U
Toluene	ug/L	0.45	0.45	U
1,3-Dichloropropane	ug/L	0.40	0.40	U
2-Hexanone	ug/L	0.99	0.99	U
Dibromochloromethane	ug/L	0.40	0.40	U
Ethylene Dibromide (EDB)	ug/L	0.67	0.67	U
Tetrachloroethylene (PCE)	ug/L	0.60	0.60	U
1,1,1,2-Tetrachloroethane	ug/L	0.64	0.64	U
Chlorobenzene	ug/L	0.56	0.56	U
Ethylbenzene	ug/L	0.26	0.26	U
Bromoform	ug/L	0.88	0.88	U
Styrene	ug/L	0.84	0.84	U
1,1,2,2-Tetrachloroethane	ug/L	0.20	0.20	U
1,2,3-Trichloropropane	ug/L	0.58	0.58	U
Isopropylbenzene	ug/L	0.80	0.80	U
Bromobenzene	ug/L	0.73	0.73	U
n-propylbenzene	ug/L	0.48	0.48	U
2-Chlorotoluene	ug/L	0.49	0.49	U

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

METHOD BLANK: 3374522

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
4-Chlorotoluene	ug/L	0.44	0.44	U
1,3,5-Trimethylbenzene	ug/L	0.68	0.68	U
tert-butylbenzene	ug/L	0.53	0.53	U
1,2,4-Trimethylbenzene	ug/L	0.54	0.54	U
sec-butylbenzene	ug/L	0.38	0.38	U
1,3-Dichlorobenzene	ug/L	0.43	0.43	U
1,4-Dichlorobenzene	ug/L	0.97	0.97	U
1,2-Dichlorobenzene	ug/L	0.63	0.63	U
n-Butylbenzene	ug/L	0.64	0.64	U
1,2-Dibromo-3-Chloropropane	ug/L	2.3	2.3	U
1,2,4-Trichlorobenzene	ug/L	0.84	0.84	U
Naphthalene	ug/L	0.73	0.73	U
Hexachlorobutadiene	ug/L	0.40	0.40	U
1,2,3-Trichlorobenzene	ug/L	0.86	0.86	U
Xylene (Total)	ug/L	0.56	0.56	U
1,2-Dichloroethane-d4 (S)	%	110	70-128	
Toluene-d8 (S)	%	99	77-119	
Bromofluorobenzene (S)	%	108	86-123	

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Dichlorodifluoromethane	ug/L	20	20	18	101	91		10		
Chloromethane	ug/L	20	20	18	101	88		13		
Vinyl Chloride	ug/L	20	19	18	95	89	70-130	6	20	
Bromomethane	ug/L	20	22	20	108	99		9		
Chloroethane	ug/L	20	20	19	100	93		7		
Trichlorofluoromethane	ug/L	20	23	21	116	103		12		
Acrolein (Propenal)	ug/L	100	110	100	109	104		5		
Acetone	ug/L	20	24	20	119	100		18		
1,1-Dichloroethylene	ug/L	20	20	20	99	98	70-130	2	20	
Iodomethane (Methyl Iodide)	ug/L	20	18	12	88	58		41		
Acrylonitrile	ug/L	20	20	19	98	96		3		
Methylene Chloride	ug/L	20	23	23	113	97		4		
Carbon Disulfide	ug/L	20	19	19	97	94		4		
trans-1,2-Dichloroethylene	ug/L	20	19	19	97	95		1		
Methyl tert-butyl Ether (MTBE)	ug/L	20	19	19	96	97	70-130	2	20	
1,1-Dichloroethane	ug/L	20	19	19	97	97		0		
Vinyl Acetate	ug/L	20	33	33	163	166		2		
2-Butanone (MEK)	ug/L	20	19	19	95	97		2		

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
cis-1,2-Dichloroethylene	ug/L	20	20	19	98	96	70-130	1	20	
Bromochloromethane	ug/L	20	21	20	104	100		4		
Chloroform	ug/L	20	19	19	96	95	70-130	1	20	
2,2-Dichloropropane	ug/L	20	21	20	107	102		5		
1,2-Dichloroethane	ug/L	20	19	20	97	99		2		
1,1,1-Trichloroethane	ug/L	20	19	19	96	94		2		
1,1-Dichloropropene	ug/L	20	19	18	95	92		3		
Carbon Tetrachloride	ug/L	20	19	18	93	92		1		
Benzene	ug/L	20	19	18	96	92	70-130	4	20	
Dibromomethane	ug/L	20	20	19	98	93		4		
1,2-Dichloropropane	ug/L	20	19	18	96	90		7		
Trichloroethene	ug/L	20	18	18	93	88	70-130	5	20	
Bromodichloromethane	ug/L	20	19	19	96	93		3		
2-Chloroethyl Vinyl Ether	ug/L	20	21	20	104	98		6		
cis-1,3-Dichloropropene	ug/L	20	20	19	99	95		5		
4-Methyl-2-pentanone (MIBK)	ug/L	20	19	19	95	97		2		
trans-1,3-Dichloropropylene	ug/L	20	20	19	100	97		3		
1,1,2-Trichloroethane	ug/L	20	19	18	96	91		5		
Toluene	ug/L	20	19	19	96	93	70-130	3	20	
1,3-Dichloropropane	ug/L	20	19	19	97	94		3		
2-Hexanone	ug/L	20	19	19	97	97		0		
Dibromochloromethane	ug/L	20	19	18	95	88		8		
Ethylene Dibromide (EDB)	ug/L	20	19	18	95	92		3		
Tetrachloroethylene (PCE)	ug/L	20	19	19	96	94	70-130	2	20	
1,1,1,2-Tetrachloroethane	ug/L	20	19	18	94	92		3		
Chlorobenzene	ug/L	20	20	19	98	93	70-130	6	20	
Ethylbenzene	ug/L	20	20	19	98	94	70-130	4	20	
Bromoform	ug/L	20	19	18	96	88		9		
Styrene	ug/L	20	20	18	98	90		9		
1,1,2,2-Tetrachloroethane	ug/L	20	22	20	108	102		6		
1,2,3-Trichloropropane	ug/L	20	21	19	104	95		8		
Isopropylbenzene	ug/L	20	19	19	97	96		1		
Bromobenzene	ug/L	20	21	20	103	98		5		
n-propylbenzene	ug/L	20	20	20	102	99		3		
2-Chlorotoluene	ug/L	20	20	19	99	96		3		
4-Chlorotoluene	ug/L	20	22	21	109	104		5		
1,3,5-Trimethylbenzene	ug/L	20	20	19	99	96		3		
tert-butylbenzene	ug/L	20	20	19	100	96		4		
1,2,4-Trimethylbenzene	ug/L	20	20	19	99	96	70-130	4	20	
sec-butylbenzene	ug/L	20	20	19	98	95		3		
1,3-Dichlorobenzene	ug/L	20	21	20	103	98	70-130	6	20	
1,4-Dichlorobenzene	ug/L	20	21	20	104	98		7		
1,2-Dichlorobenzene	ug/L	20	21	19	103	97	70-130	6	20	
n-Butylbenzene	ug/L	20	21	20	107	101		6		

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

LABORATORY CONTROL SAMPLE & LCSD: 3374523 3374524

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
1,2-Dibromo-3-Chloropropane	ug/L	20	23	22	116	108		7		
1,2,4-Trichlorobenzene	ug/L	20	21	20	106	100		6		
Naphthalene	ug/L	20	20	19	101	95		7		
Hexachlorobutadiene	ug/L	20	21	21	106	104		2		
1,2,3-Trichlorobenzene	ug/L	20	21	19	104	96		8		
Xylene (Total)	ug/L	60	59	56	99	94	70-130	5	20	
1,2-Dichloroethane-d4 (S)	%				99	104	70-128	5		
Toluene-d8 (S)	%				98	99	77-119	1		
Bromofluorobenzene (S)	%				101	104	86-123	3		

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Dichlorodifluoromethane	ug/L	0	200	390	136		
Chloromethane	ug/L	0	200	490	170		
Vinyl Chloride	ug/L	0	200	480	166	70-130	
Bromomethane	ug/L	0	200	500	173		
Chloroethane	ug/L	0	200	500	172		
Trichlorofluoromethane	ug/L	0	200	510	177		
Acrolein (Propenal)	ug/L	0	1000	1700	121		
Acetone	ug/L	90	200	580	155		
1,1-Dichloroethylene	ug/L	0	200	360	124	70-130	
Iodomethane (Methyl Iodide)	ug/L	0	200	260	91		
Acrylonitrile	ug/L	0	200	370	127		
Methylene Chloride	ug/L	8	200	430	148		
Carbon Disulfide	ug/L	0	200	310	108		
trans-1,2-Dichloroethylene	ug/L	0	200	360	124		
Methyl tert-butyl Ether (MTBE)	ug/L	0	200	390	134	70-130	
1,1-Dichloroethane	ug/L	0	200	350	120		
Vinyl Acetate	ug/L	0	200	690	239		
2-Butanone (MEK)	ug/L	4.1	200	390	134		
cis-1,2-Dichloroethylene	ug/L	0	200	370	127	70-130	
Bromochloromethane	ug/L	0	200	380	132		
Chloroform	ug/L	0	200	340	117	70-130	
2,2-Dichloropropane	ug/L	0	200	370	129		
1,2-Dichloroethane	ug/L	0	200	420	146		
1,1,1-Trichloroethane	ug/L	0	200	370	128		
1,1-Dichloropropene	ug/L	0	200	360	124		
Carbon Tetrachloride	ug/L	0	200	370	127		

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	0	200	340	117	70-130	
Dibromomethane	ug/L	0	200	340	117		
1,2-Dichloropropane	ug/L	0	200	360	125		
Trichloroethene	ug/L	0	200	320	111	70-130	
Bromodichloromethane	ug/L	0	200	360	125		
2-Chloroethyl Vinyl Ether	ug/L	0	200	360	125		
cis-1,3-Dichloropropene	ug/L	0	200	410	143		
4-Methyl-2-pentanone (MIBK)	ug/L	12	200	440	146		
trans-1,3-Dichloropropylene	ug/L	0	200	370	129		
1,1,2-Trichloroethane	ug/L	0	200	310	108		
Toluene	ug/L	0	200	320	112	70-130	
1,3-Dichloropropane	ug/L	0	200	370	127		
2-Hexanone	ug/L	0	200	580	200		
Dibromochloromethane	ug/L	0	200	310	109		
Ethylene Dibromide (EDB)	ug/L	0	200	320	111		
Tetrachloroethylene (PCE)	ug/L	0	200	370	127	70-130	
1,1,1,2-Tetrachloroethane	ug/L	0	200	310	107		
Chlorobenzene	ug/L	0	200	310	109	70-130	
Ethylbenzene	ug/L	0	200	340	117	70-130	
Bromoform	ug/L	0	200	370	127		
Styrene	ug/L	0	200	320	112		
1,1,2,2-Tetrachloroethane	ug/L	0	200	380	130		
1,2,3-Trichloropropane	ug/L	0	200	370	130		
Isopropylbenzene	ug/L	0	200	280	96		
Bromobenzene	ug/L	0	200	310	109		
n-propylbenzene	ug/L	0	200	300	104		
2-Chlorotoluene	ug/L	0	200	290	101		
4-Chlorotoluene	ug/L	0	200	330	115		
1,3,5-Trimethylbenzene	ug/L	0	200	280	99		
tert-butylbenzene	ug/L	0	200	270	95		
1,2,4-Trimethylbenzene	ug/L	0	200	290	101	70-130	
sec-butylbenzene	ug/L	0	200	280	98		
1,3-Dichlorobenzene	ug/L	0	200	300	106	70-130	
1,4-Dichlorobenzene	ug/L	0	200	300	104		
1,2-Dichlorobenzene	ug/L	0	200	290	101	70-130	
n-Butylbenzene	ug/L	0	200	310	107		
1,2-Dibromo-3-Chloropropane	ug/L	0	200	350	120		
1,2,4-Trichlorobenzene	ug/L	0	200	350	122		
Naphthalene	ug/L	0	200	260	89		
Hexachlorobutadiene	ug/L	0	200	360	124		
1,2,3-Trichlorobenzene	ug/L	0	200	330	113		
Xylene (Total)	ug/L	0	600	1000	120	70-130	

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QUALITY CONTROL DATA

Workorder: F2000467 LCU PLANTS DEMO

MATRIX SPIKE SAMPLE: 3374525 Original: F2000467001

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane-d4 (S)	%	113			134	69-134	
Toluene-d8 (S)	%	104			105	72-122	
Bromofluorobenzene (S)	%	110			96	79-126	

QUALITY CONTROL DATA QUALIFIERS

Workorder: F2000467 LCU PLANTS DEMO

QUALITY CONTROL PARAMETER QUALIFIERS

U The compound was analyzed for but not detected.

I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

V Method Blank Contamination

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467001	FMBWWTP D6U			EPA 9056	WCAf/1070
F2000467002	FMBWWTP D6L			EPA 9056	WCAf/1070
F2000467003	FMBWWTP D5U			EPA 9056	WCAf/1070
F2000467004	FMBWWTP D5L			EPA 9056	WCAf/1070
F2000467005	FMBWWTP D4U			EPA 9056	WCAf/1070
F2000467006	FMBWWTP D4L			EPA 9056	WCAf/1070
F2000467007	FMBWWTP D3U			EPA 9056	WCAf/1070
F2000467008	FMBWWTP D3L			EPA 9056	WCAf/1070
F2000467009	FMBWWTP D2U			EPA 9056	WCAf/1070
F2000467010	FMBWWTP D2L			EPA 9056	WCAf/1070
F2000467011	FMBWWTP D9			EPA 9056	WCAf/1071
F2000467012	SCWWTP-D-4			EPA 9056	WCAf/1071
F2000467013	SCWWTP-D-2/2.5FT			EPA 9056	WCAf/1071
F2000467014	SCWWTP-D-3 / 2.5FT			EPA 9056	WCAf/1071
F2000467015	WWEWTP D-9			EPA 9056	WCAf/1071
F2000467016	WWEWTP D-1 DEEP			EPA 9056	WCAf/1071
F2000467017	WWEWTP D-1 TROUGH			EPA 9056	WCAf/1071
F2000467018	WWEWTP D-2			EPA 9056	WCAf/1071
F2000467001	FMBWWTP D6U			SM 2540G	WCAf/1077
F2000467002	FMBWWTP D6L			SM 2540G	WCAf/1077
F2000467003	FMBWWTP D5U			SM 2540G	WCAf/1077
F2000467004	FMBWWTP D5L			SM 2540G	WCAf/1077
F2000467005	FMBWWTP D4U			SM 2540G	WCAf/1077
F2000467006	FMBWWTP D4L			SM 2540G	WCAf/1077
F2000467007	FMBWWTP D3U			SM 2540G	WCAf/1077
F2000467008	FMBWWTP D3L			SM 2540G	WCAf/1077
F2000467009	FMBWWTP D2U			SM 2540G	WCAf/1077
F2000467010	FMBWWTP D2L			SM 2540G	WCAf/1077
F2000467011	FMBWWTP D9			SM 2540G	WCAf/1077
F2000467012	SCWWTP-D-4			SM 2540G	WCAf/1077
F2000467013	SCWWTP-D-2/2.5FT			SM 2540G	WCAf/1077
F2000467014	SCWWTP-D-3 / 2.5FT			SM 2540G	WCAf/1077

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467015	WWEWTP D-9			SM 2540G	WCAf/1077
F2000467016	WWEWTP D-1 DEEP			SM 2540G	WCAf/1077
F2000467017	WWEWTP D-1 TROUGH			SM 2540G	WCAf/1077
F2000467018	WWEWTP D-2			SM 2540G	WCAf/1077
F2000467015	WWEWTP D-9	SW-846 3010A	DGMt/1143	SW-846 6010	ICPt/1090
F2000467018	WWEWTP D-2	SW-846 3010A	DGMt/1143	SW-846 6010	ICPt/1090
F2000467013	SCWWTP-D-2/2.5FT	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467014	SCWWTP-D-3 / 2.5FT	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467016	WWEWTP D-1 DEEP	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467017	WWEWTP D-1 TROUGH	SW-846 3010A	DGMt/1144	SW-846 6010	ICPt/1091
F2000467015	WWEWTP D-9	SW-846 7470A	DGMt/1147	SW-846 7470A	CVAt/1046
F2000467018	WWEWTP D-2	SW-846 7470A	DGMt/1147	SW-846 7470A	CVAt/1046
F2000467007	FMBWWTP D3U	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467008	FMBWWTP D3L	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467009	FMBWWTP D2U	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467010	FMBWWTP D2L	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467011	FMBWWTP D9	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467012	SCWWTP-D-4	SW-846 3010A	DGMt/1154	SW-846 6010	ICPt/1096
F2000467013	SCWWTP-D-2/2.5FT	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467014	SCWWTP-D-3 / 2.5FT	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467016	WWEWTP D-1 DEEP	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467017	WWEWTP D-1 TROUGH	SW-846 7470A	DGMt/1156	SW-846 7470A	CVAt/1049
F2000467007	FMBWWTP D3U	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467008	FMBWWTP D3L	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467009	FMBWWTP D2U	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467010	FMBWWTP D2L	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467011	FMBWWTP D9	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: F2000467 LCU PLANTS DEMO

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
F2000467012	SCWWTP-D-4	SW-846 7470A	DGMt/1157	SW-846 7470A	CVAt/1050
F2000467001	FMBWWTP D6U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467002	FMBWWTP D6L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467003	FMBWWTP D5U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467004	FMBWWTP D5L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467005	FMBWWTP D4U	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467006	FMBWWTP D4L	SW-846 3010A	DGMt/1166	SW-846 6010	ICPt/1102
F2000467001	FMBWWTP D6U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467002	FMBWWTP D6L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467003	FMBWWTP D5U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467004	FMBWWTP D5L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467005	FMBWWTP D4U	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467006	FMBWWTP D4L	SW-846 7470A	DGMt/1171	SW-846 7470A	CVAt/1057
F2000467001	FMBWWTP D6U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467002	FMBWWTP D6L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467003	FMBWWTP D5U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467004	FMBWWTP D5L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467005	FMBWWTP D4U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467006	FMBWWTP D4L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467007	FMBWWTP D3U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467008	FMBWWTP D3L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467009	FMBWWTP D2U	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467010	FMBWWTP D2L	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209
F2000467011	FMBWWTP D9	SW-846 5030B	MSVt/1208	SW-846 8260B	MSVt/1209

Advanced
Environmental Laboratories, Inc.

6681 Southpoint Parkway
Jacksonville, Florida 32216
Office (904) 363-9350
Fax (904) 363-9354

Queue: ICPt

Batch Number: 1102

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: All holding times were met.

III. Method

Analysis: SW-846 6010

Preparation: SW-846 3010A

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Duplicates: All acceptance criteria were met.

D. Spikes: The matrix spike (MS) recoveries of silver and lead for F2000467001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in this matrix. The affected sample is qualified to indicate matrix interference.

E. Serial Diluion: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

G. Other:

Advanced Environmental Laboratories, Inc.

6681 Southpoint Parkway
Jacksonville, Florida 32216
Office (904) 363-9350
Fax (904) 363-9354

Queue: MSVt

Batch Number: 1209

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: All holding times were met.

III. Method

Analysis: SW-846 8260B

Preparation: SW-846 5030B

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: The Method Blank (MB) contained low levels of Methylene Chloride above the Method Detection Limit (MDL), a known laboratory contaminant. In accordance with AEL QA, all sample results found in the Method Blank are flagged with a V qualifier to indicate the data is an estimate. Samples F2000467001-11 are considered affected.

C. Surrogates:

D. Spikes: The matrix spike recoveries of Vinyl Chloride and Methyl tert-butyl Ether (MTBE) for F2000467001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS), Laboratory Control Sample Duplicate (LCSD) and %RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. The associated sample is qualified with a J4 to indicate an estimated result.

E. Internal Standard: All acceptance criteria were met.

F. Samples: TCLP samples F2000467001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011 were analyzed at the lowest dilution. In accordance with AEL protocol, all TCLP samples require a minimal dilution of 10X prior to analysis due to the complex matrices produced during the preparation method.

G. Other:

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☐ Altamonte Springs: 380 Northlake Blvd., Ste. 1048, FL 32701 • 407.937.1594 • Fax 407.937.1597
☒ Fort Myers: 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Fax 239.674.8128 Lab ID: E
☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Fax 904.363.9354 Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E

52.377.2349 • Fax 352.395.6639 Lab ID: E82001
54.889.2288 • Fax 954.889.2281 Lab ID: E82535
13.630.9616 • Fax 813.630.4327 Lab ID: E84589

* F 2 0 0 0 4 6 7 *

Client Name: GHD	Project Name: LCU Plants Demo
Address: 5904 Hampton Oak Pkwy	Project Number: 11207990
Tampa, FL	PO Number:
Phone: 813-971-3882	FDEP Facility No:
FAX: 813-971-1862	FDEP Facility Address:
Contact: Jennifer Rogers	
Sampled By: W. McKinney	Special Instructions: 5* mix of soil/gravel/anthracite
Turn Around Time: ☒ STANDARD ☐ RUSH	
AEL Profile #:	☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED: TCLP VOC	TCLP metals(RCRA8 and copper)	total Sulfate	Preservation	Field-Filtered?	LABORATORY I.D. NUMBER
FMB WWTP	D6 U	G	1.27.20	9:40	S*			✓	✓	✓			001
FMB WWTP	D6 L	"	"	9:50	S*			✓	✓	✓			002
FMB WWTP	D5 U	"	"	10:20				✓	✓	✓			003
FMB WWTP	D5 L	"	"	10:30				✓	✓	✓			004
FMB WWTP	D4 U	"	"	11:20				✓	✓	✓			005
FMB WWTP	D4 L	"	"	11:30				✓	✓	✓			006
FMB WWTP	D3 U	"	"	12:15				✓	✓	✓			007
FMB WWTP	D3 L	"	"	12:25				✓	✓	✓			008
FMB WWTP	D2 U	"	"	13:15				✓	✓	✓			009
FMB WWTP	D2 L	"	"	13:25	↓			✓	✓	✓			010

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☐ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked

Temp. when received (observed) 5.9 °C Temp. when received (corrected) 5.9 °C

DCN: AD-051 Form last revised 02/12/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McKinney	1.27.20	16:00	[illegible]	1/27/20	1300
2	[illegible]	1/27/20	1310	[illegible]	1/29/20	1310
3						
4						

FOR DRINKING WATER USE:

(When PWS Information not otherwise supplied) PWS ID: _____

Contact Person: _____ Phone: _____

Supplier of Water: _____

Site-Address: _____

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☐ Fort Myers: 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Fax 239.674.8128 Lab ID: E84492
☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Fax 904.363.9354 Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E811095
☐ Gainesville: 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Fax 352.395.6639 Lab ID: E82001
☐ Miramar: 10200 USA Today Way, FL 33025 • 954.889.2288 • Fax 954.889.2281 Lab ID: E82535
☐ Tampa: 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Fax 813.630.4327 Lab ID: E84589

F2000467 Page 1 of 1

Client Name: GHD
Address: 5904 Hampton Oak Pkwy
Tampa, FL
Phone: 813-971-3882
FAX: 813-971-1862
Contact: Jennifer Rogers
Sampled By: W. McKinney
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile #:

Project Name: LCU Plants Demo
Project Number: 11207990
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions: S* = soil/sand/anthracite/gravel media
☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED: TCLP VOC	TCLP metals (RCRA8) and copper	total sulfate	LABORATORY I.D. NUMBER
	Preservation										
	Field-Filtered?										
FMB WWTP	D-9	C	1-27-20	14:00	S*			✓	✓	✓	011

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge
Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☑ Yes ☐ No ☑ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked
Temp. when received (observed) 3.7 °C Temp. when received (corrected) 3.7 °C

DCN: AD-051 Form last revised 02/12/2019
Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McK	1-27-20	16:00		1/27/20	1300
2		1/27/20	1310		1/29/20	1310
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID:
Contact Person: Phone :
Supplier of Water:
Site-Address:

Advanced Environmental Laboratories, Inc.
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☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Fax 850.219.6275 Lab ID: E811095
☐ Gainesville: 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Fax 352.395.6639 Lab ID: E82001
☐ Miramar: 10200 USA Today Way, FL 33025 • 954.889.2288 • Fax 954.889.2281 Lab ID: E82535
☐ Tampa: 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Fax 813.630.4327 Lab ID: E84589

F2000467 Page 1 of 1

Client Name: GHD
Address: 5904 Hampton Oak Pkwy.
Tampa, FL
Phone: 813-971-3882
FAX: 813-971-1862
Contact: Jennifer Rogers
Sampled By: W. McKinney
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile #:

Project Name: LCU Plants Demo
Project Number: 11207990
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	BOTTLE SIZE & TYPE	ANALYSIS REQUIRED (RCRA 8 + copper)	TCLP Metals	Total Sulfate	LABORATORY I.D. NUMBER
							Preservation				
							Field-Filtered?				
SCWWTP -	D-4	G	1-28-20	10:30	SO	2		✓	✓		012
SCWWTP -	D-2/2.5'	"	"	12:15	"	2		✓	✓		013
SCWWTP	D-3/2.5'	"	"	12:40	"	2		✓	✓		014
WWEWTP	D-9	"	"	15:10	"	2		✓	✓		015
WWEWTP	D-1 Deep	"	"	16:00	"	2		✓	✓		016
WWE WTP	D-1 Trough	"	"	15:45	"	2		✓	✓		017
WWE WTP	D-2	"	1-29-20	8:50	"	2		✓	✓		018

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = ice H=(HCl) S = (H_2SO_4) N = (HNO_3) T = (Sodium Thiosulfate)

Received on Ice ☒ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☐ Where required, pH checked

Temp. when received (observed) 5.7 °C Temp. when received (corrected) 5.8 °C

DCN: AD-051 Form last revised 02/12/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	W. McK	1-29-20	12:30		1/27/20	1300
2		1/27/20	1310		1/29/20	1310
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID:
Contact Person: Phone :
Supplier of Water:
Site-Address: